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論文 (*Article*)

60 Models of Creativity

For Studying How Particular Repertoires of Such Models in Creators Affect Their Creativity

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A One Sentence Overall Synopsis: This paper presents 60 models of creativity, organized as ten sets of six each, found in the minds and work procedures of 150 highly creative people, half US, half global, from 63 diverse strata of society. Models of creativity from academic research corresponding to some of these models were used to change model terminology to reflect common concepts and ideas between them.

Research Questions;
the Primary Questions:

A. What are the various models of creativity in any way now operative in the minds of all creators? How do these differ from academic models of creativity?
B. What distinguishes creativity from effectiveness, educatedness and the other 52 orthogonal disciplines--ones cutting across traditional ones and determining who rises to their tops? What relationally and representationally define "creativity" as one of those orthogonal fields?

the Secondary Questions:

1. **Is creativity one thing or many diverse things? Is creativity one process or many diverse processes?**
2. **How much of creativity is domain dependent and how much is domain independent?**
3. **Is the quite general impression and assumption that creativity is one thing not diverse things a result of people going to and depending on the psychology literature too much and missing research on creativity in mechanical engineering, fine arts, performance, media, systems bio and other fields?**
4. **If creativity is diverse things or processes, are they in trade-off relations to each other so that supports for one or a few, hinder a few or many others?**
5. **Would creativity improve more by perfecting one's existing model of creating or by adding new models one does not now use or know about?**
6. **How do scholar models of creativity differ from creator models of their own creativity?**
7. **Do knowledge models found in experts have an analog found in creators?**
8. **Does meta-cognition in cognitive psychology have an analog in creativity, namely, some sort of meta-creation?**
9. **Do creators who are more meta-creative out-create creators who are less meta-creative?**
10. **How many models of creating are there, if creativity turns out to be diverse things not one thing?**
11. **How do the models of creativity published by academics differ from the models of creativity we obtain from creators via categorical modeling of interview and questionnaire results?**

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The primary reason this study of creativity models was done was to answer the above questions. The questions above are linked. If creativity is plural things not a single thing, then how you "support" and "encourage" it will be much more complex than if it is merely one thing that one simple environment can "support". The results of this study show that when experts measure how well organization environments support "creativity", unless they distinguish which of the 60 different modes of "being creative" found in the research that this paper reports, they end up assessing very thoroughly how such environments support 1/60th or 3/60ths of the modes of being creative actually there--that is, they miss how well many other modes of being creative are supported, how many such modes are actually there, and how much creativity might improve were modes of being creative not there now to be installed in the future. This paper provides an important tool for assessing just how many types of being creative any one organization has and then, how well each is supported by particular environments.

Furthermore, the results of this study show that models of creativity, that creators have, influence how they create and how their ability to create evolves. Therefore, finding models of creating that creators have, as done in this study, adds value missed when we instead just depend on models of creativity from scholars studying it. Knowledge models found in experts, in artificial intelligence research, have their analogs in creation models in creators, in creativity research. Meta-cognition, in psychology in general, has an analog in meta-creation, in creativity, where a creator notices the models of creativity he/she has and how he/she uses them. Since meta-cognition in general improves intelligence and work performance, we can suppose that meta-creation, that is, creators noticing and using creation models in their work, would improve creativity. To test this we need to know what models of creativity any particular creator uses compared to such models used by other creators (and compared to models of creating from academic research).

Research Method:

1. **My strategy is to use what artificial intelligence "expert systems" research found about determining models inside minds of experts to understand models of creating inside minds of creators and combine those results with using what total quality found about "pleasing" and "satisfying" customers to understand how creators "please" and "satisfy" customers of their creations.**
2. **A dual recommendation system (from artificial intelligence expert systems research) of 315 eminent people (5 in each of 63 diverse strata of society) nominating 150 "highly creative people" in their own and other fields**
3. **Total quality customer satisfaction and artificial intelligence protocol analysis combined to make interviews and questionnaires given to these 150 creators (the interviews were mainly to motivate creators to fill in the questionnaires completely), asking them how they create, how that evolves, how much they know about how they create, and encounters with each of these in creators they know**
4. **Bottom up grouping of similar items in both questionnaires and interview transcripts produces successively smaller, more abstract levels of creativity models**
5. **The resulting model of 60 models of creativity compared with models of the research literature on creativity and edited to reflect common ideas**

A stratified sample of 150 creative people, half American, half global, in 63 widely different fields of endeavor were interviewed, using techniques modified from "protocol analysis" techniques of artificial intelligence expert systems building, to obtain models, explicit or implicit in practices, of what "creation" was for each creator. The interview used had twelve specially designed "doorways" intended to be diverse approaches to getting beyond unthinking, mystifying, automatic, and stereotyped ideas about "creation" to actual key factors in models the creators themselves used. Content analysis of transcripts produced 111 creation models that, when categorized by similarity, reduced to 60 creation models organized in ten groups of six models each. Where similar models in the research literature on creativity were found, terminology in the models was modified

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to make such similarities evident, and elaborations on key concepts from research literature were added to the models. A book summarizing all 60 models was built, with one chapter per model, all chapters using the same format of headings and subheadings.

Results:

1. A model of 60 models of creativity, with each model having at least 10 variables defining it

This paper has only enough space to present the model of 60 models of creativity and the research that produced that model, along with hypotheses about the role of traits (of the repertoires of models of creativity in creators) in making them creative, to be explored in future research. This paper's result, a model of 60 models of creation, is a prerequisite for verifying the hypotheses.

Key Words : models of creativity, creativity trade-offs, meta-creation, meta-cognition, theories of creation, creator theories, knowledge management, innovation, Silicon Valley, design, fine arts

From Knowledge Models to Creation Models

In previous work, I published knowledge model types found in building software expert systems of the heuristics used by experts in various fields (Greene, 1993, p. 512):

Each expert used and presented knowledge of his or her domain organized in these types of formats--diagnostic rules, modules that messaged each other, hierarchies of components and subcomponents, and the like. Arguments and failed collaborations among experts often stemmed from the same knowledge appearing in different knowledge model types that the various parties used. Re-invention of concepts when organizations try to move ideas across "practices" consists largely, though not entirely, of translation from the knowledge model types favored by one practice to those favored by others (Brown and Duguid, 2000).

Some of the experts I interviewed for building expert systems appeared creative and some did not, but all were distinguished in their fields, respected and emulated. I wondered at that time what would happen if, instead of experts, we built expert systems of "creators"--artists, successful social activists, scientific discoverers, venture business founders, device inventors, or, merely, people in the same field as my experts but who were said to be "creative" rather than "expert". In particular, I assumed creators would have personally-favored knowledge model types as experts: would they also have personally-favored creation model types? This paper reports research to answer that question.

Experts have models, explicit or implicit in practices, of what knowledge is, in their domain: "knowing X" means being able to diagnose A, B, or C, "knowing X" means knowing the components of A, B, or C, and similarly for other types of knowledge. Creators seem to have models of what "creating X" is that are similar. Does whether such models are explicit or implicit affect creativity of

22 Knowledge Model Types from Artificial Intelligence Research and Practice, Greene, 1993
---Any Knowledge Can Appear in Any of the Below Formats, Being Mistaken for Different Knowledge

type name	example	type name	example
selection	facing A/B/C select A, facing D/E avoid E,	decision tree	if X is true, is A big, if A big, did C go, if yes do V
symptom diagnosis	if A is present do test M, else do test V	protocol analysis	now I am considering Y, I wonder if Z would do
causal diagnosis	B present rules out M cause, makes P likely	object message	when X receives A it sends D to Y which does P
composition	the parts of X are A, B, and C	state transition	signal A moves us to state M, signal B to state N
monitoring	when you spot A, do B, looking for any M	search space	from these 100 alternatives, let's explore A & B
scientific method	M's evidence P more credible than N's Q & R	knowledge flow	fact A in form Z converts to doing M aiding P
case based reasoning	case X is like old case B with difference M	concept ordering	A contributes to B and C, X to A and D,
data type	X type of data gets handled M way, not N way	philosophic argument	Z implies not X and weak Y, D rules out Z and A
group mind	all of us X's believe and do Y when M is true	narrative	A did Z to M making Y till B did X ruining A
problem decomposition	to do goal A first do goal M and P, to do P do V	cognition model	input M blended with X makes Z stored in F till V
flowchart	when X is B do Y, else do Z, next do M	association	A reminds me of fat V, B suggests old M feels P

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output by the creator? Does the presence of multiple such models in a creator increase or otherwise affect his or her creativity of output? Does which particular models of creativity are in a particular creator's repertoire affect his or her creativity of output?

Key here is getting models of creating that creators use, consciously or unconsciously in their work, rather than depending on models of creativity that scholars of creativity use for doing their research. My work building expert systems convinced me that there were many more models of creating inside minds of experts than scholars had published in their journals.

A search of published research on creativity in common fields like sociology, psychology, political science, mechanical engineering, cognitive science, human-computer interface design, artificial intelligence (over 1600 books and 552 journal articles were scanned, too numerous to list bibliographically here, see the references in Greene, 2003, 2) produced virtually no prior research on this issue (we must distinguish models of creation that scholars devise from studying creators from models of creating inside the minds of creators). Instead what was published was a tendency for creators to mystify the origins of their amazing outcomes--"well, gosh, I just went to work as usual and suddenly this idea appeared", "I don't have any idea how such a wonderful thing happened, really", and the like. There were a few stories--the insight story ("this idea just appeared from nowhere"), the no-responsibility story ("I just did what I always do and a strange wonderful result suddenly appeared"), and others--that appeared again and again. Rare creators, like Piccaso, treated in books by successive wives and collaborators, were quoted supporting a productivity, a marketing, an influence, or a paradigm type model of creating. Few if any creators could articulate coherent models of what creativity actually was, except for a few Nobelists and similar others forced by fame to give speeches (whereupon they hit the books to come up with coherent models of what they had for decades before been doing without benefit of explicit creation models in most cases). A few creators, in moving from one field to another had to transpose past approaches to creativity in themselves into terms that made sense in their new domain--forcing them to invent somewhat coherent models of what creating was for them. Overall, however, rather trite models of what creation was dominated the literature and probably caused serious researchers to show little interest in whatever models of creativity were in creators.

This is similar, however, to knowledge model types in experts. Few if any experts knew that they favored particular types of knowledge formatting over others and considered knowledge not in those formats not really useful or even not really knowledge in their field. When artificial intelligence people protocol analyzed them, however, they found very particular formats of knowledge preferred, even used exclusively by them (Greene, 1993, p. 525). One of the skills that made experts expert at what they did was their facility putting bits and pieces of knowledge into usable formats rapidly and accurately, where novices were slow to do this (Chi et al, 1988). Some experts, when shown the knowledge types they preferred and excluded, were interested and reported later that it improved how they worked (Greene, 1993, p. 525). They had been unaware of it. This suggested to me that creators, if shown what creation models they used and excluded, might improve their overall creativity of output. I wanted to confirm this with research. The obvious first step was mapping all the models of creation explicitly or implicitly used by actual creators of diverse types. That is what this paper reports.

From Meta-Cognition to Meta-Creation, from More Models to More Creativity

A creator who creates while unaware of the model of creation he uses (it is implicit in his practices of creating) is not meta-creative, we can say. Meta-cognition is a well known ability that people have to monitor how their own thinking is going, paying attention to how well their mind is working, how many alternatives it has just considered, observing what operations it has performed already and what ones it has yet to perform, and the like (Flavell, 1977). Higher levels of meta-cognition have been found to be a part of intelligent and good performance in a number of domains (Sternberg, 1996; Sternberg and Horvath, 1999). Meta-creation, we can say, is creators observing how they create and modifying actively how they create. This inevitably involves having a model of how they create specifying possible points where they can intervene to modify how they create. Meta-creation, thusly defined, is merely general meta-cognitive activity applied to the mental work of creating, so, we can extend existing results on how meta-cognition improves intelligent and good performance to say that meta-creation (meta-cognition of activities involved in creating) will improve the intelligence and goodness of

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creative performance, that is, will improve creativity achieved (goodness of creation being creativity here).

The quality of meta-cognition, like the quality of any observational mental activity, is improved when a person can notice more patterns and phenomena (Sternberg, 1999, Chapter 18). Having more frameworks and more abstract frameworks to apply to a stream of inputs to the mind, allows people to spot more patterns and more subtle patterns in those streams (Holyoak and Thagard, 1995). We can expect, then, that creators having more frameworks applicable to creation itself, will spot more patterns in their creation work and have more possible places to intervene to change creativity of outcomes. Models of creation itself are these frameworks applicable to creation itself. Creators having more models of creation spot more patterns in their creation work and have more places to intervene to affect creativity of outcomes.

We can expect, then, that more such models, more diverse such models, more consciously perused such models improve creativity of outcome. Before we can explore such hypotheses we have to have a model of models of creativity in most or in a great many creators of diverse fields. Being able to specify how many such models, how diverse they are, how explicitly used they are for each creator is a prerequisite for confirming these hypotheses. This paper reports the building of just such a model of models of creativity operating in a rather diverse stratified sample of American creators.

From Protocol Analysis of Experts to Doorway Analysis of Creators

Anyone who has actually done protocol analysis of experts knows what a huge undertaking it is (and hence why there is little research involving it or on doing it). Asking an expert every 15 seconds what is on his or her mind, while he or she does hours of design work or inventing work, then coding the huge resulting transcript into cognitive operators operating on cognitive operands, is an immense amount of painstaking work (Ericsson and Simon, 1980). That no one has done this for any single creator is not surprising and I have to admit I myself was daunted at the prospect. I wanted a short cut that would avoid that immensity while allowing me to determine models of creation explicit or implicit in the work of nearly all creative people.

First interviews with real creators to obtain what models of creation were explicit and implicit in their work were dismal undertakings at best--nearly all creators interviewed stopped at the insight story or no responsibility story stage. Either their creativity was magical or so much outside-of-them that they knew nothing about it, they said. This happened so often I began to notice that perhaps creators were deliberately hiding or mystifying the basis of their work. Whereas many of them insisted they wanted their works to speak for them, I suspected ulterior motives at work (hiding how they achieved things made their performances more magical and impressive). I also noticed that the more famous and accomplished a creator was, the less he or she depended on hiding or mystifying his/her work and the more interest he/she showed in seriously introspecting to find what models of creation he/she actually depended on. Such creators also showed interest in finding models of creation entirely absent from their own lives and work.

Initial experiments with various interview strategies gradually uncovered what I later called "doorways" in interviews that got people past their own hiding, mystification tendencies, that is past their own insight or no responsibility stories. Each doorway worked with some creators not others and often with some parts of a person's work and not others.

Doorway 1: Metaphor
What is your process of work like?
What is like your process of work?

Doorway 2: Difficulty
What stymies or stops or defeats you in creating what you create?
How? Why? When? Where?

Doorway 3: Uniqueness
What do you do, in each of your works, that no one else in the world does? What is done in this step of your creation process that is done in no other step in that process?

Doorway 4: Evolution
How does your current process of work differ from how you worked years ago? What direction is your way of work evolving in/toward?
Why?

Doorway 5: Surprise
What surprises happen to you while doing your work? Why? When?
What does each mean?
What does each result in?

Doorway 6: Wit, Inventiveness
What is clever about how you do

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what you do? What do you do in clever ways that ordinary or average people would not think of or be willing to try?

Doorway 7: Revolt
What mistake of your field's way of working did you and your work fix, reveal, avoid, transform?

Doorway 8: Alternative Way
What is another way of doing that X that you do? What gets lost in using that alternative? How? Why? What others ways have you tried and failed with? What other ways do you want to try out in the future? Why?

Doorway 9: Factors
What influences you while you work and how your work turns out? What sorts of things influence you while you work and how your work turns out?

Doorway 10: Alien Viewpoint
What would an alien from another world notice about how you do what you do? What would "it" or "they" observe you doing?

Doorway 11: Conquest
What do you overcome, defeat, vanquish as you work?

Doorway 12: Emergence
What emerges, as if from nowhere, as you work? When and how and where are you transported emotionally while working?

In the actual interviews as delivered, each doorway was attempted four times in different ways, at different points during the interview. One of those ways, for each of the 12 doorways, was a game way of delivering a question, where a prop was given the interview subject and they were asked to represent something about how they create using that prop.

The Stratified Sample of American Creators

Having neither the time nor money for a representative national sample of creators and there being no affordable way to even nominate such a sample, I decided on a stratified sample, using highly abstract models of society components to insure a certain minimum amount of dispersion, variety, and unbiasedness to the sample obtained. Lists of the most famous five people in each of the 63 boxes in the matrix below, half Americans, half global, were made (nominated by socially well connected MBA students from my University of Chicago classes, and from print media, mostly, plus a few association lists), and they by phone, email, or regular mail were asked to nominate who in their field were now the most creative two people. They were also asked to name the two creative people in the field they currently most disagreed with the work of. One person nominated as most creative and one person nominated as most disagreed with (of a total of ten such people, respectively, of each sort per box) were

	Science	Art	Humanities	Social Science	
Economic	technology ventures, idea markets, invention markets	museums, exhibitions, concerts, tours, coffee houses, clubs	resource limitation management; mystifications, historic preservation	economics: markets, pricing, regulation, trade regimes & orgs	
Political	voting gaming representation campaigning	awards, cannons	agreement limitation management, power embeddings realization	political science: elections, campaigns, administrating, consensus	
Cultural	ethics and religion policy making social clubs charities	art venture districts	meaning limitation management. false consciousness identifying	anthropology: deliberate culture invention, community enhancement	
Social Change	democratization globalization	social cabarets	confidence and direction limitation management, frame-limited revolts	sociology: social process and structure-- decline, fixing, invention	
Traditional	astronomy geology meterology oceanography space sciences	painting, music (song writers, performers, conductors), sculpture, dance, comedy, drama (theatre stars, movie stars), poetry,	history philosophy	tribal community: festivals, calendars, wealth inheritance, bias in laws	
Establishment	physics biology chemistry math	performance, design	literature, counseling regimes, critics, awards, theatre industries	rise and fall of civilizations, rutted cultures	
Emerging	information media silicon and non-silicon computing h/w	digital art, interactive art, socially composed art, cyberart, virtual worlds	applied humanities, group composing, composing contests	networks, social virtuality	

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then randomly chosen and interviewed for each of the 63 boxes below. In some cases a third person was interviewed as a matter of appropriateness and convenience resulting in 150 subjects interviewed in a period of five years. All interview questions were asked in the same phrasing and order in each interview with no exceptions (the few interviews that were exceptions to this were dropped from the dataset). A questionnaire repeating what was asked in the interviews, but with format differences, was administered after each interview.

Transcripts were content analyzed with variables affecting how creation was achieved, what was the core of creating, and what was considered creative, marked and categorized, first for each of the 12 doorways, then results across doorways merged. Similar results across creators were grouped resulting in 111 creation model types. A further more painstaking analysis of similarities among models reduced that number to 60 (this mostly involved spotting overly elaborate models in individual creators and treating them as combinations of two or more simpler models near to models found in other creators already). These were then grouped and groups named resulting in ten sets of six models each (Greene, 1, 2003). The ten sets were then ordered and the six models within each set ordered, following similar principles of ordering. Flowchart models of each model were made and a book (Greene, 2, 2003), with fifteen pages per model for all 60 models, created for future use with research collaborators and organizations wanting their creativity-models-in-use situations mapped. Research literature in many fields was then surveyed for models of creation similar to those found in interviews. Where such similar models were found, terminology of the models was changed to make such similarities evident. In many cases interview subjects combined multiple creation models, or used one model early in creating and another later, or elaborated variables beyond what creativity research literature mentioned in similar models. The illustrations at the end of this article present the model of 60 models as completely as present space allows. Uses of the model, to be explored in future research are discussed immediately below. The research process is summarized in the diagram below.

	Engineer-ing	Professions	Fad & Fashion	Lifestyle	Systems
	financial engineering, inventors agriculture	business and management advertising & marketing	fashion designers, branding, multi-industry marketing by events	housing, communities locale type	technical innovation, quality movements
	cyberdemocracy, internet funding of campaigns, net volunteer management	administration military	party politics, third party movements	involvement dimensions	policy deployment, dissatisfaction deployment
	community organizing, environmental,	religion education	lifestyle inventions, green movement	performing-consuming balance; diet, videogaming, manga	diversity management & expansion
	innovation venture districts/clusters	movement builders	intellectual movements, liberation movements	social entrepreneurs, self funding "profitable" charities	coalition building, foundation grants
	exploration, civil, architecture	medicine, nursing welfare	crowd generation, trend riding marketing, trend seeding, social imbalance exacerbations	festival organizers, theme parks, global event organizers	value sharing, negotiation, non-medical healing, reputation networks
	mechanical, electrical, aeronautics & space	law & justice	epidemic generation, rights movements (human rights etc.)	consumer movement	value sustaining/imposition
	biological & genetic, computer, internet society, nano tech--their blends	info tech, quantum devices	internet options: 6 billion channel TV broadcasting, agile economy	lifestyle inventors, micro institution development via viral growth regimes	complex adaptive systems research

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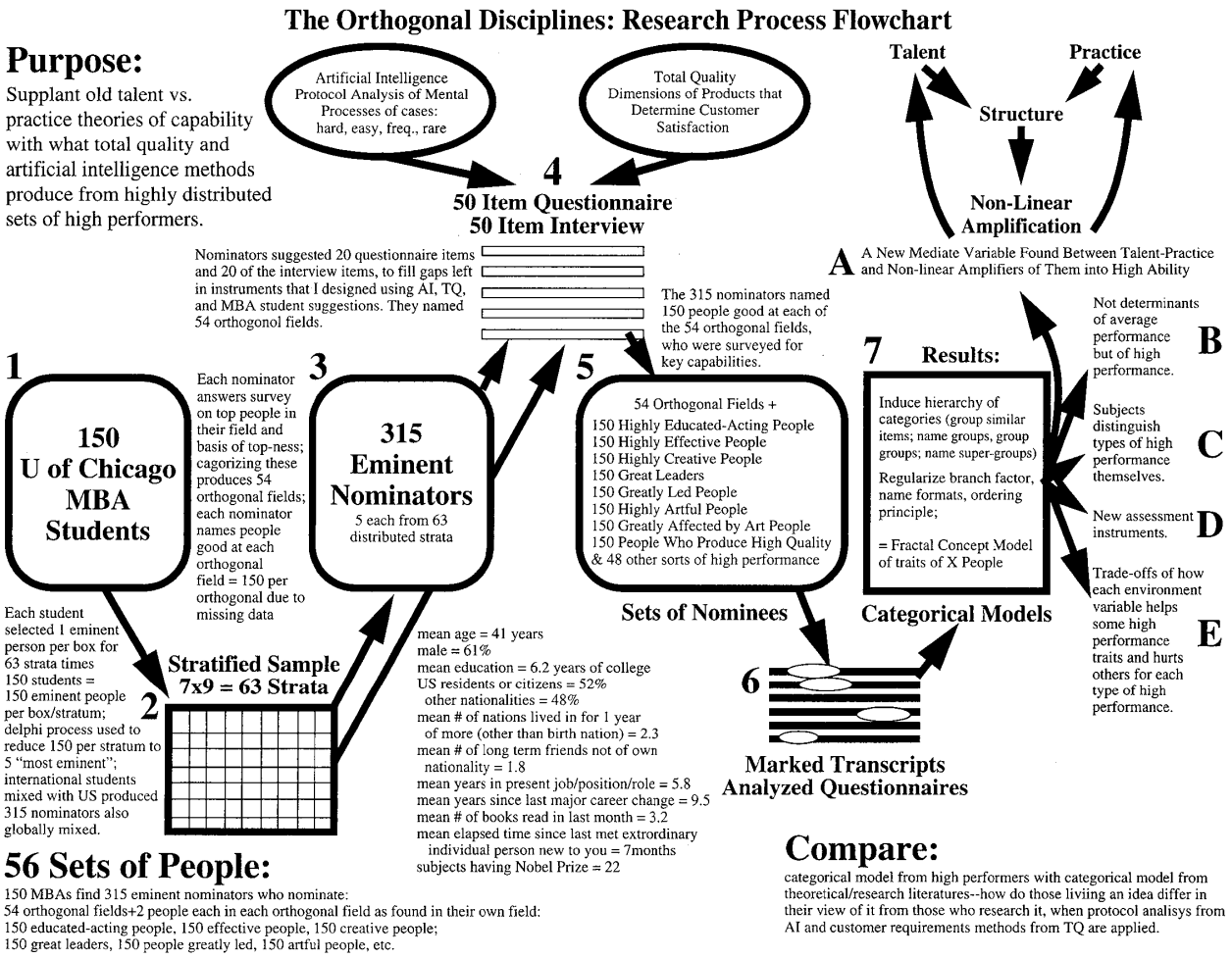

Hypotheses Concerning the Role in Creating of Particular Traits of the Particular Repertoires of Creation Models that Various Creators Have

Now that a comprehensive model of models of creating from actual creators exists, refined by similar models from the research literature on creativity, we can use that model for research. The following hypotheses can be explored by using models such as the one this paper presents.

TRIVIAL HYPOTHESES

Hypothesis 1: Implicit Models Exist

Every creator implicitly uses at least one model of what "creating" is. Most such creators are unaware of that model consciously.

Hypothesis 2: Changing Fields Explicitizes Creation Models

Creators who create in one field and move from that to creating in another have more explicit knowledge of the model of creating they use than creators staying in one field for their entire career.

INDIVIDUAL HYPOTHESES

Hypothesis 3: Model Explicitization Increases Creativity

Creators who are conscious of the model of creativity that their creative work is based on are more creative, overall, than creators unaware of their model and the work they do after becoming conscious of their model of creativity is more creative than the work they do before that.

Hypothesis 4: Model Pluralization Increases Creativity

Creators who have more than one model of creating are more creative than creators who have only one model, regardless of degree of explicitness of the models.

Hypothesis 5: Model Diversity Increases Creativity

Creators who have more diverse models of

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creating are more creative than creators who have only various models similar to each other, regardless of how many and how explicit those models be.

Hypothesis 6: Model Progression Conformance Increases Creativity with Rare Exceptions

There are certain progressions among models of creativity characteristic of the careers of creators in particular fields. People violating the sequence among such models in such fields are less creative than people conformant to them, in general, but rare exceptions to this, in effect invent new sequences that others in the field later follow.

Hypothesis 7: Explicit Model Introduction Increases Creativity

Introducing creative people to models of creation that they are unaware of, increases their creativity if they find interesting the models. The more such models they use and the more diverse the models the more improvement in their creativity results.

Hypothesis 8: Particular Model Combines Out-Create Others

Particular combinations of creation model are more "creative" in results than others, even when in different creators.

GROUP HYPOTHESES

Hypothesis 9: Organizations Have Repertoires of Creation Models

Organizations have sets of creation models implicit in their practices or explicit in their most creative people or subgroups.

Hypothesis 10: Individual/Group Non-Difference in Creation Model Effects

The same changes in model explicitness, number, and diversity that increase individual creator creativity also increase organization creativity when applied to models in the organization.

Hypothesis 11: Creation Model Conflicts

Subgroups assigned to cooperate or co-invent if using different creation models will fail, falter, or be less creative than subgroups assigned to cooperate or co-invent that use the same creation models.

Hypothesis12: Creation Model Synergies

Subgroups assigned to cooperate or co-invent if using different creation models that, for some reason, do not mesh, will be less creative than subgroups assigned to cooperate or co-invent that use different creation models that do mesh well ("mesh" here will, as a research construct require a great deal of definitional work).

Hypothesis 13: Environment Supports are Only Meaningful When Specific to Particular Creation Models of an Organization

Measuring environment supports for any sort of "in general" creativity, though done by many organizations, has little value because it does not identify the models of creativity in the organization and distinguish environment support levels for each part of each such model--to have value you have to measure environment supports for each part of each model of creativity in an organization as well as supports for models elsewhere not now in the organization but that would be good additions to the models it already has.

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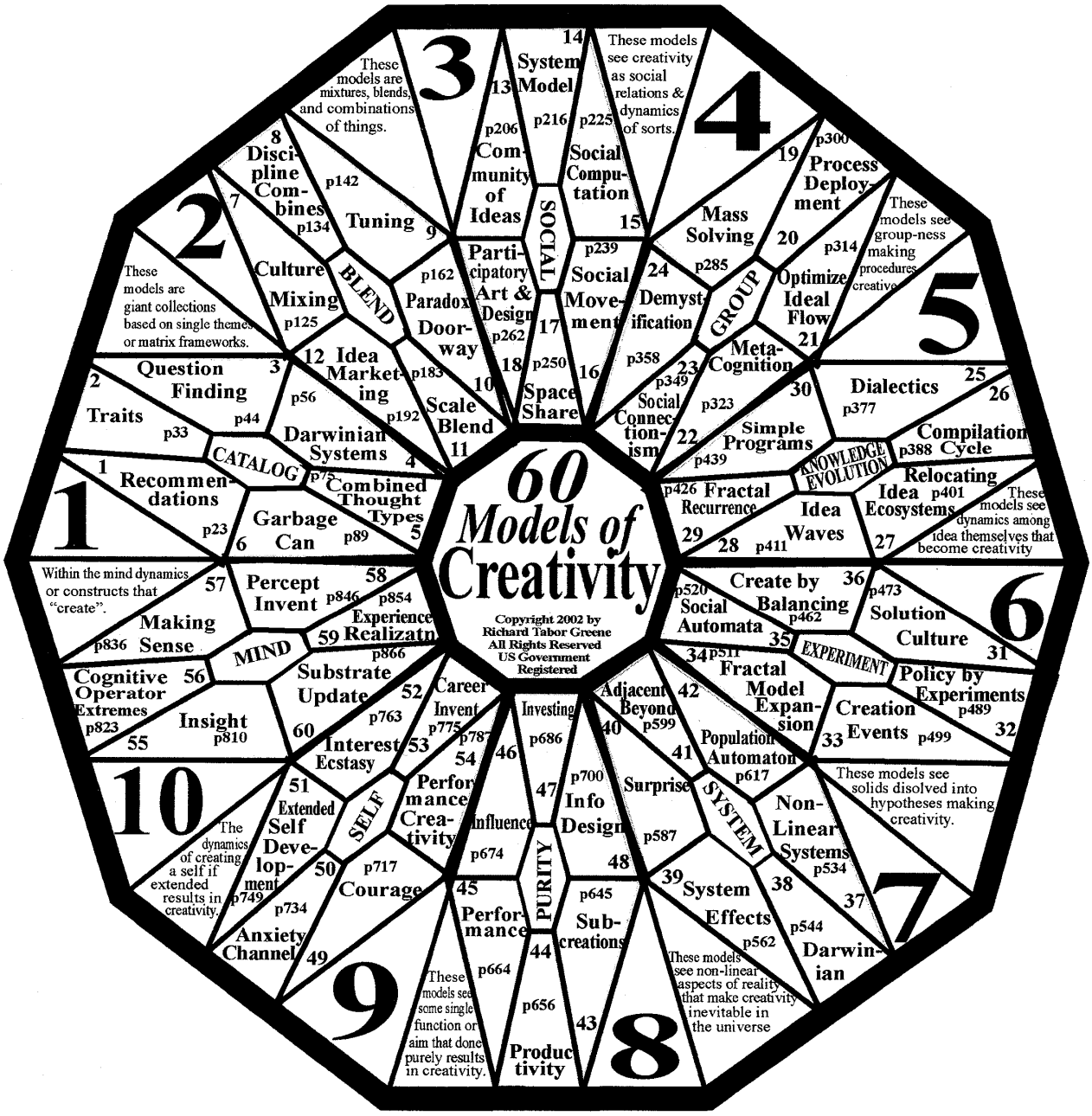

Minimalist Definitions of the 60 Models of Creativity
Plus Instant Assessment Column

	Model Name	Model Minimal Definition	Circle One Number
CATALOG	Recommendations	I collect recommendations from mentors, peers, and others on how to be creative in general or on how I can be more creative, organize them, and regularly review them to improve the creativity of my work.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Traits	I collect traits that creative people, works, domains, and fields have, organize them, and regularly review them to improve the creativity of my work.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Question Finding	I collect ways that creative people find great questions to tackle, organize the, and regularly review them to improve the creativity of my work.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Darwinian Systems	I notice how persons and works in my domain, and how my domain itself and the people who run it, all four, foster the basic evolution functions of variation, combination, selection, and reproduction. I use the result to position myself for maximal creativity.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Combined Thought Types	I select certain types of thinking and develop them individually as well as exploring possible combinations of them till creativity results.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Garbage Can	I use nearly all fundamental parts of my existence from personal identity to social dynamics around me to ways of work to develop partial creations of life and work style that become tools for making creative works.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me

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	Model Name	Model Minimal Definition	Circle One Number
BLEND	**Culture Mixing**	I use the various cultures I have been exposed to, have within me, or live among now, blending them till creation emerges.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Discipline Combines	I use the various fields I have been exposed to, have mastered, or live among now, blending them till creation emerges.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Tuning	I position myself between extremes and polar opposites, tuning my approach toward subtle points between extremes where creativity happens.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Paradox Doorway	I seek out paradoxes and force myself against them till they, in turn, force my thinking out of its ruts and into lateral, peripheral new paths that open up creativity to me.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Scale Blend	I seek out phenomena on multiple size scales, aligning them by similarities of various sorts, till phenomena on one size scale solve major problems on other size scales.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Idea Marketing	I market ideas within my own mind to various viewpoints I can develop mentally, then select best fit ideas to market, again within my own mind to representations of actual social market forces in my field, till I come up with a creative work as the package that transmits that idea to those social market forces in my field effectively.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
SOCIAL	**Community of Ideas**	I assemble possibly relevant ideas and let them interact as their own natures dictate, noticing how they pair up, conflict, sequence themselves and in general inter-relate, till powerful interesting such idea assemblages come to my attention as possible creations.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	System Model	I influence the social judgement dynamics of that field of people who judge what works are creative or not in the domain in which I work by tuning the dialog among myself, my creative work, those judges, and rules of the domain till creation appears.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Social Computation	I am in the midst of a community of people among whom flow various social computations having inputs, outputs, and processors consisting of layers each more flexible than the next of hardware, firmware, software, in each layer of which are operations each having input, output, and processor (repeating the above endlessly). I manage that flow till at where I am in the community a critical mass of ideas appears that becomes creativity.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Social Movement	I am in the midst of a community of people among whom frustration builds up till released into a social movement of new ideas by the slightest particular new idea, avalanching the entire community into a new overall idea configuration.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Space Sharing	I share the same intellectual space with a community of like-minded others, inventing tools that intensify that sharing and pursuing competitively similar intellectual goals till rather unpredictable slightnesses among us and the ideas we work with cause creativity to appear somewhere among us.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Participatory Design	I notice how in modern societies specialization of function has stripped certain kinds of thought, thinking, collaboration, feeling, from entire populations concentrating it in profit-making centralized industries and create by undoing important pieces of that harmful over-centralization and over-concentration.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
GROUP	**Mass Solving**	I define a certain solving process and get many people to simultaneously apply it while interacting with each other tuning their motivations, interactions, and configurations till creativity emerges.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Process Deployment	I come up with one interesting process after another and deploy them across certain social configurations of people, tuning motivations, interactions, and configurations till creativity emerges.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Optimize Ideal Flow	I identify the intended flow of energy through particular systems and optimize the design, environments, conditions, and controls of the system to get as close as possible all of the energy to flow in the intended path through the system till performance or qualities never seen before emerge.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Meta-Cognition	I organize my tools, facilities, collaborators, associated institutions and relationships for heightened meta-cognition--awareness of how we think and work till creativity emerges.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Social Connectionism	I work in certain idea layers and social relationship layers combining and selecting what comes both to my conscious symbolic mind and what comes to my unconscious associative mind, coaxing ideas and relationships through phase changes till creative new patterns emerge.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Demystification	I return power to people who have been habituated to giving power to things outside themselves via creating works that communicate a demystifying-of-the-world-message--that makes people conscious of how they have given power and options to things outside themselves that rule them unwholesomely.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
KNOWLEDGE	**Dialectics**	I find myself embedded in large evolving forces and patterns, defining myself by opposing large established ways, as younger ones gradually define themselves by opposing my work as large established way.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Compilation Cycle	I work with many different traits that knowledge has, compiling knowledge from one format to another watching how that affects those traits till gaps, distortions, elaborations or the like in those traits reveal creative possibilities to me.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Relocating Idea Ecosystems	I work in several different ecosystems of ideas and by bridging particular ideas from one ecosystem to another or from one idea ecosystem to a different social ecosystem, I turn them into creations.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Idea Waves	I find myself in an ocean of ideas where waves of coherent different sets of ideas wash over the diverse parts of society, including me, regularly such that by setting up tools and workstyles that catch these passing waves and combine ideas across them, I end up creating.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Fractal Recurrence	I live among different schools of thought that arise and oppose one another, fuse and split, so that I use how very abstract idea polarities and oppositions keep reappearing through time and on different scales of thinking to, by doing the next inevitable step in this process, create.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Simple Programs	I analyze situations till I find a way to model all the interesting and important complexity of the situations using the simplest thinkable system types yet capable of generating all that complexity, then by changing such simplest system parameters I generate hosts of creations.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me

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	Model Name	Model Minimal Definition	Circle One Number
EXPERIMENT	**Solution Culture**	I notice how people often choose exactly those solutions guaranteed to perpetuate their problems, how failures and missed opportunities are not accidents so much as logical extensions of entire "cultures of failing" that build up unseen in people--by reversing traits of such failure cultures I invent and apply solution cultures that then create solutions to long standing recalcitrant problems.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Policy by Experiments	I try certain strategies or policies in order to generate data about how reality is really working, then use that revealed data to redefine the problem and devise better strategies and policies revealing in turn better data on the basis of which to devise better strategies and policies, repeated endlessly till creation emerges.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Creation Events	I gradually find and combine components of an idea or approach, assembling various people, resources, ideas into a series of events, designed around particular idea or people combination procedures, taken from experts, from which emerges a final creation.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Fractal Model Expansion	I organize ideas into multi-scale hierarchies, tightly ordered vertically in layers and horizontally in idea-categories, then I expand the geometry configuration of the ideas, inventing new ideas at every level and category, coming up with dozens of creations at once.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Social Automata	I tune the interactions among many interacting people, arranged in certain neighborhoods and trained in certain behaviors of interacting, adjusting connectedness, diversity, and deployment of initiative-taking in the system till creations emerge.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Create by Balancing	I envision my domains of thinking and work using very comprehensive abstract models to spot slighted dynamics and over-emphasized one, then create by devising tactics that rebalance the domain by emphasizing slighted dynamics on my abstract models or slighting over-emphasized ones.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
SYSTEM	**Non-Linear Systems**	I build models of my domain as a network of non-linear interactions among populations of agents with butterfly effects, system avalanches from one attractor to another, first mover advantage, and I tune interactions among agents till better than expected results simply emerge from sudden system-wide avalanche events.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Darwinian	I set up competing ideas, approaches, relationships, or events, such that traits of successful ones combined with variants I invent populate a new population of competing entities, the whole system evolving till a creation emerges from this natural selection like process.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	System Effects	I, like everyone else, suffer from surprises as system effects, unanticipated and unanticipatable in the non-linear realities of our lives, intrude, but, unlike everyone else, I catalog, explore, and develop tools for using these non-linear effects till they become dependable creations.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Surprise	I catalog and study system effects and I catalog and collect unusual frameworks for viewing matters in my domains, using the former to anticipate surprise types and the latter to reveal surprising phenomena, till one such surprise turns into my creation.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Adjacent Beyond	I start with small tiny creations, that accumulate and combine with each new such creation I make, to make myriad new combinations, some of which are creative, which when identified, pruned of noise, and combined with my past creations, spawn still more combination possibilities, some of which turn out to be creations, exponentially continuing my stream of creations.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Population Automaton	I manage populations of interacting ideas on multiple levels of ideas-in-mind, feeling responses, performance moves and improvs, parts of organizations till insights as nonlinear system avalanche events happen, generating creations.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
PURITY	**Subcreations**	I invent little tools and processes, decor and arrangements of my personal living and workplaces to help me create still more creative tools, processes, decor, and work arrangements, in a continuing exponential stream till later ones turn out to be creations or to enable me, using them, to create what others, lacking such tools and work arrangements, cannot imagine or produce.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Productivity	I generate a lot of ideas and throw away the bad ones, and, by generating ways of producing more ideas than nearly anyone else in the same periods of time, and accumulating experience from throwing away bad ones, more and more of my ideas become creations.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Performance	I understand that I am a performer, and my performances are the ideas I produce, which perform before various audiences, using an anthropological stance of seeing the limitations of culture of my audiences and the theological stance of seeing the limitations of life itself and how my audiences position themselves within them to make my ideas creations.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Influence	I seek to influence people and the world via explosively producing disillusionment with existing frameworks with what I create which must be timed and positioned, packaged and expressed so as to influence the field of people in my domain.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Investing	I manage a portfolio of diversified investments of time, idea, and effort in parallel simultaneous projects attempting unlikely outcomes, mixing venturesome and conservative strategies, till one is a hit, and turns creative.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Info Design	I find myself in webs and configurations of structured information such that particular structural features of these information distributions result in creativity--so I work to locate such webs and locate my self and my work in such webs till I am where creativity emerges in them. I study operations on accumulated past creations that produce new ones then extrapolate them to invent my own creations.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me

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	Model Name	Model Minimal Definition	Circle One Number
SELF	**Courage**	I have the strange ability to fully appreciate the worth and inventiveness of others and traditions around me while simultaneously challenging and overthrowing all of that in everything I do, resulting in occasional creations where my challenges get accepted.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Anxiety Channel	I notice how the fundamental anxieties of existence inevitably get side-stepped, omitted, and slighted by people in my domain and the works they generate till I spot such slightings and by correcting them reconnect my domain to the deep realities of life, hence, a creation.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Extended Self Development	The first creation I made was myself, which I made by undoing automatic parts of me put there by where and how I grew up, substituting the best from history and the contemporary world, and continuing this invention of myself seamlessly turned into creating in every field I entered as the idea of extending my self via works I create.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Interest Ecstasy	I pursue interest in everything I do, balancing myself at the very edge of all my capabilities and motives, till I am transported beyond myself where forces of the universe take hold of me and use me as a vehicle for their own creating.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Career Invent	I create my self, then I create my own career through this world, then as I transition to bolder and more interesting career paths, I run out of pre-made ones and start inventing new career paths never seen before, till one of these transitions becomes creation.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Performance Creativity	I get ideas to perform before me till one set of them captures my interest then I organize ideas into performances before others in the form of works that audiences respond to till creation emerges.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
MIND	**Insight**	I alternate engagement and detachment as I apply known frames to a challenge, till I run out of existing frames and have to invent new ones, accumulating failures till they begin to specify, inversely, what eventual solutions must be like, till a slight new idea avalanches the entire set of ideas before me into an emergent sudden insight, that when carefully pruned of noise, reveals a creation.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Cognitive Operator Extremes	I drive my use of certain common cognitive operators in the mind far beyond the intensities of use of them by others till results that no one has seen before obtain, some of them later being judged creative.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Making Sense	I find nearly everything in the world flawed, sloppy, half baked, deeply unsatisfactory, and lacking basic sense, and I cultivate this negative vision capability till I see hundreds of ways to improve virtually everything in life around me, focussing on a few which I actually fix till judged creative.	0..1..2..3..4..5..6..7..8..9..10 not true of me true of me
	Percept Invent	I am drawn to the paradoxes, contradictions, gaps, omissions, anomalies, circular arguments in everything around me, seeing spaces where everyone else sees objects in scenes, till I dislocate my own perceptions enough that I see things to fix that when I fix them become creations.	0..1..2..3..4..5..6..7..8..9..10 True of me Not true of me
	Experience Realization	I keep careful track of my experiences accepting no common thoughts, explanations, without making sure they make complete sense to me and completely explain my experience of things, till I find something everyone else accepts and depends on that has a deep gap in it that does not fit my experience--by fixing it I do what others judge creating.	0..1..2..3..4..5..6..7..8..9..10 True of me Not true of me
	Substrate Update	I watch as a never-ending stream of new substrates for doing functions enters the world, from global commerce, research, and technology every day and year, and observe when existing functions and institutions hold onto past substrates at great cost way past the time when there are good alternatives substrates--by pioneering replacement of past substrates for doing functions with new ones from that never-ending stream, I create.	0..1..2..3..4..5..6..7..8..9..10 True of me Not true of me

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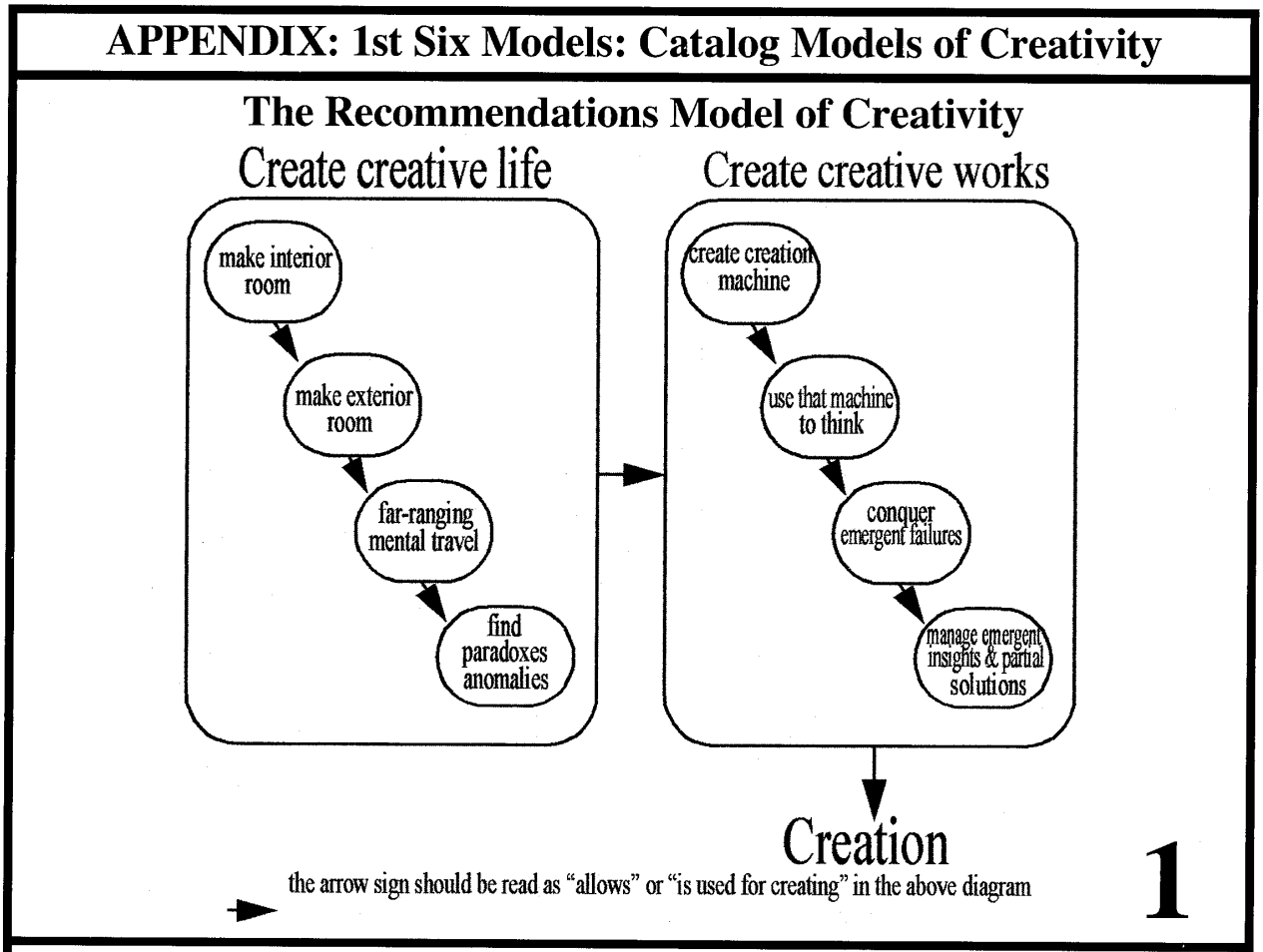
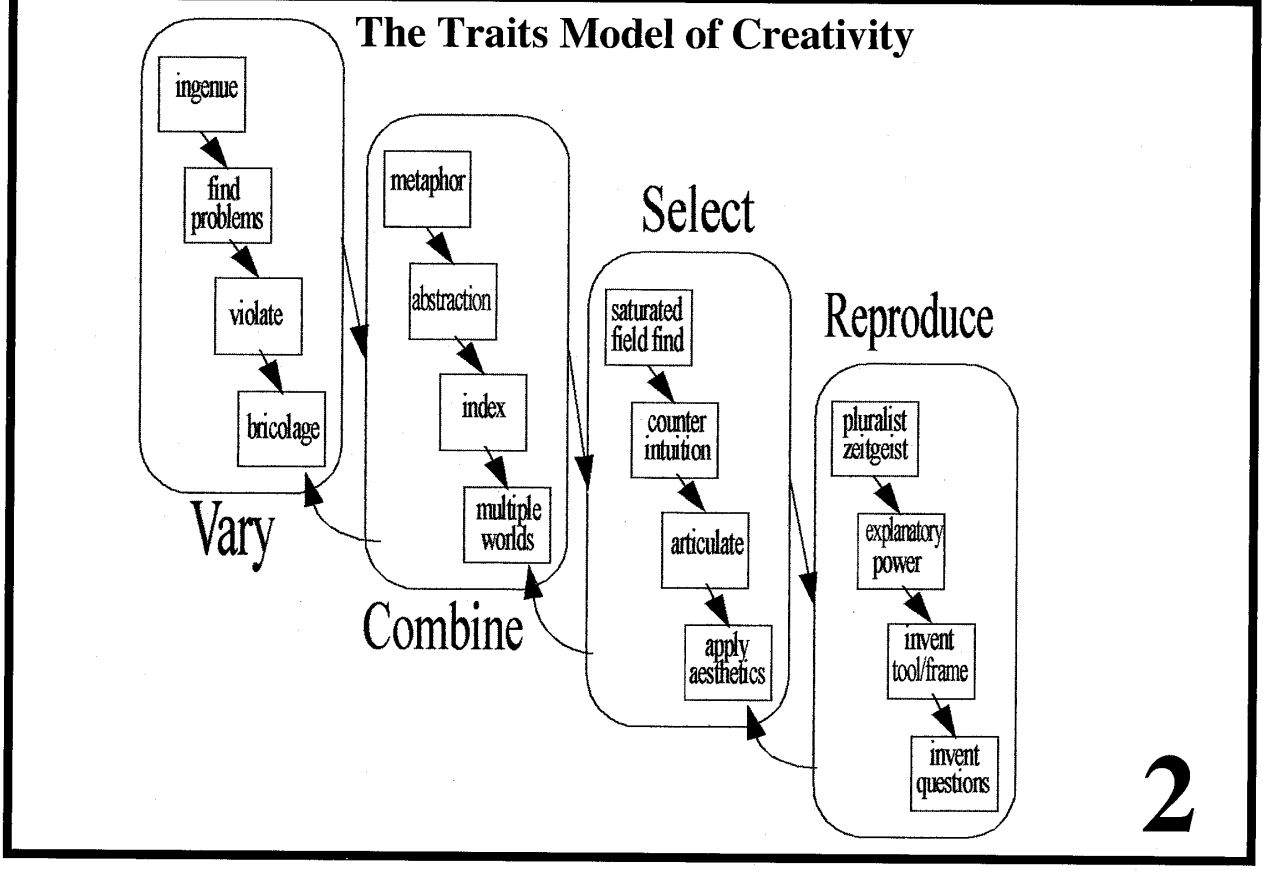
APPENDIX: 1st Six Models: Catalog Models of Creativity





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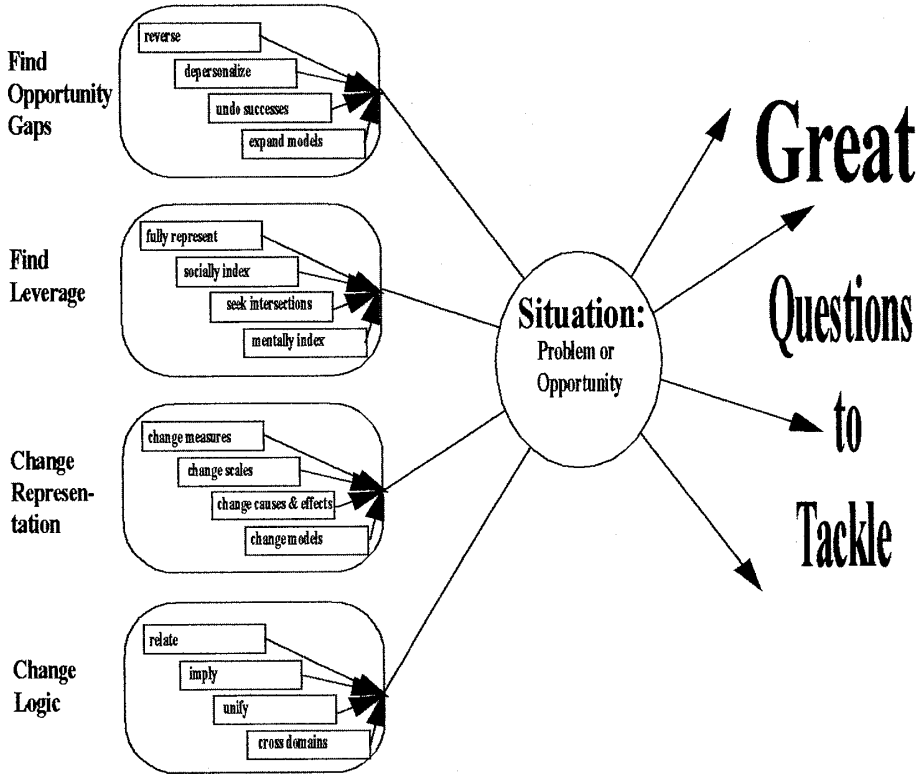
APPENDIX: 1st Six Models: Catalog Models of Creativity

The Question Finding Model of Creativity



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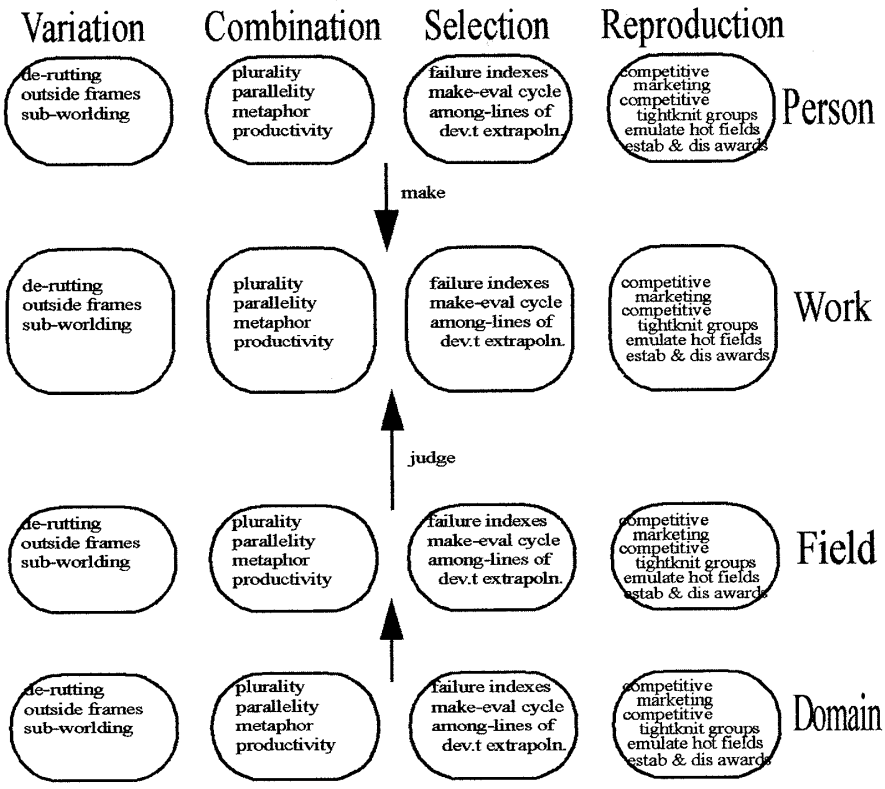
The Darwinian Systems Model of Creativity



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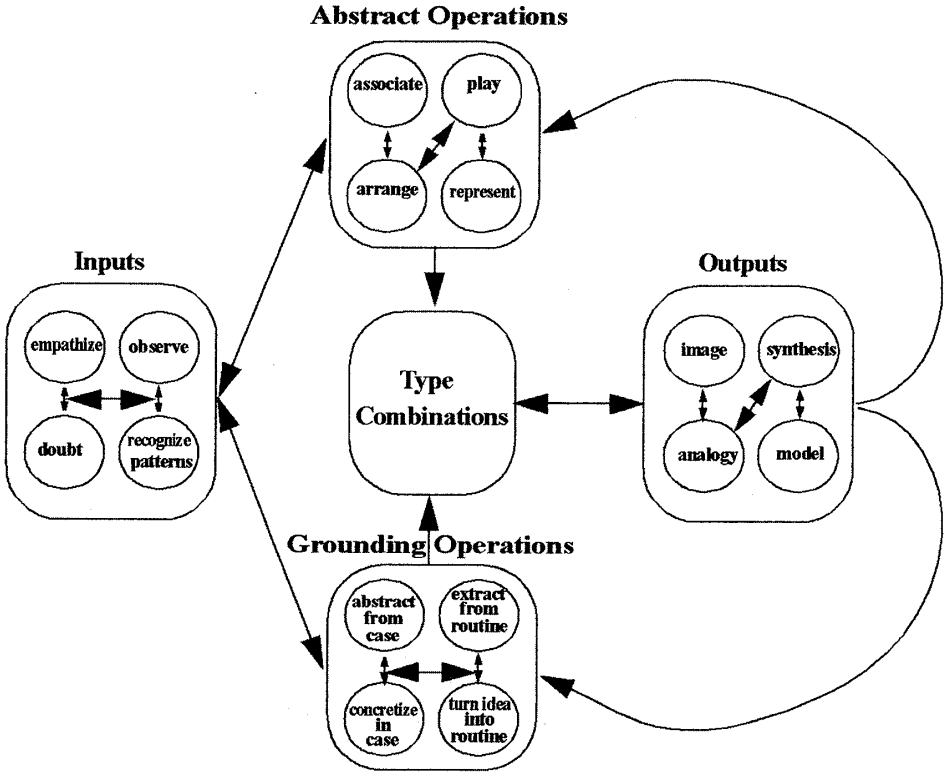
APPENDIX: 1st Six Models: Catalog Models of Creativity

The Combined Thought Types Model of Creativity



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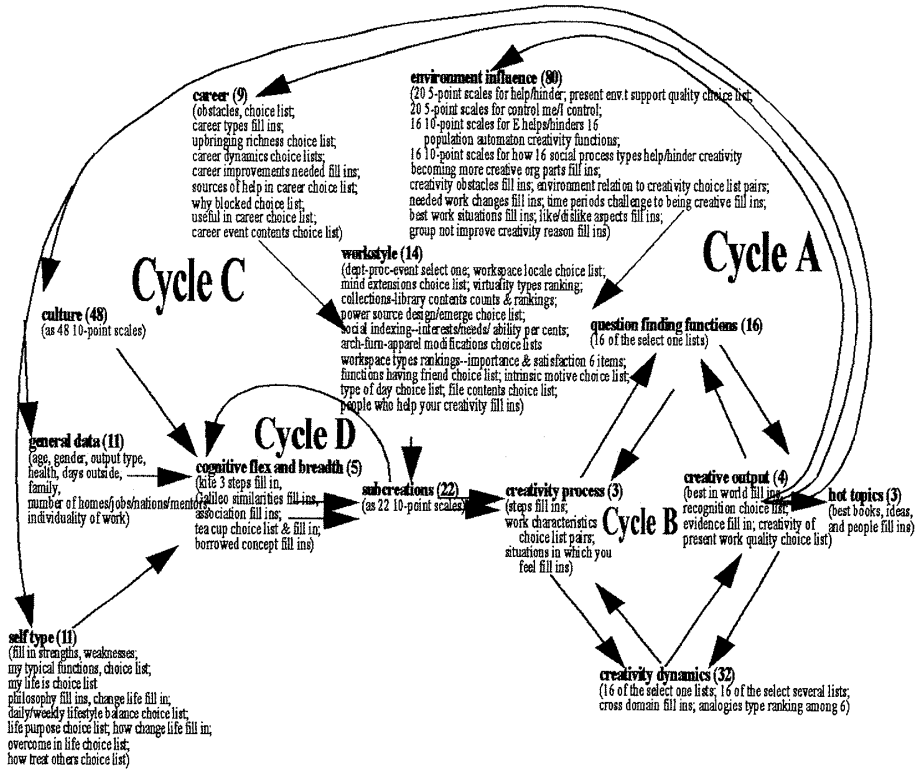
The 4 Cycle "Garbage Can" Model of Creativity



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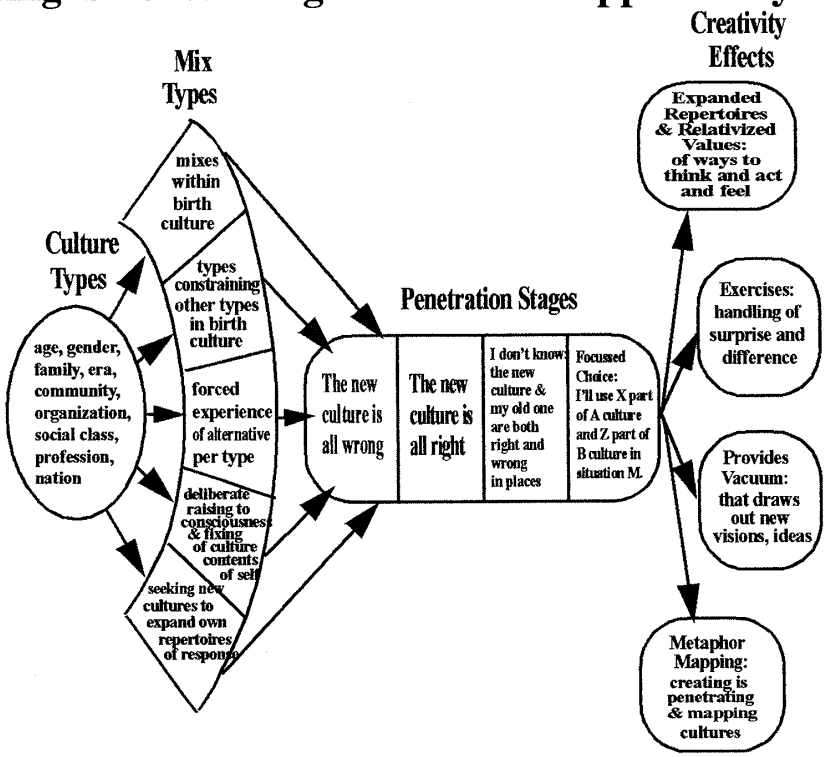
APPENDIX: 2nd Six Models: The Blend Models of Creativity

The Culture Mix Model of Creativity: Creating is Penetrating a Problem's/Opportunity's Culture



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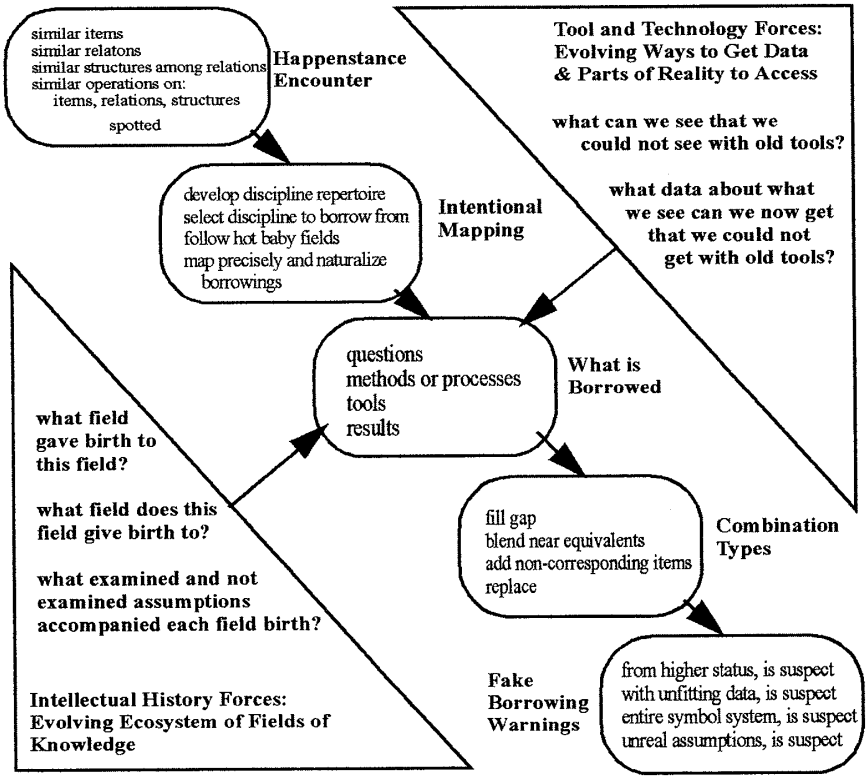
The Discipline Combinatorics Model of Creativity



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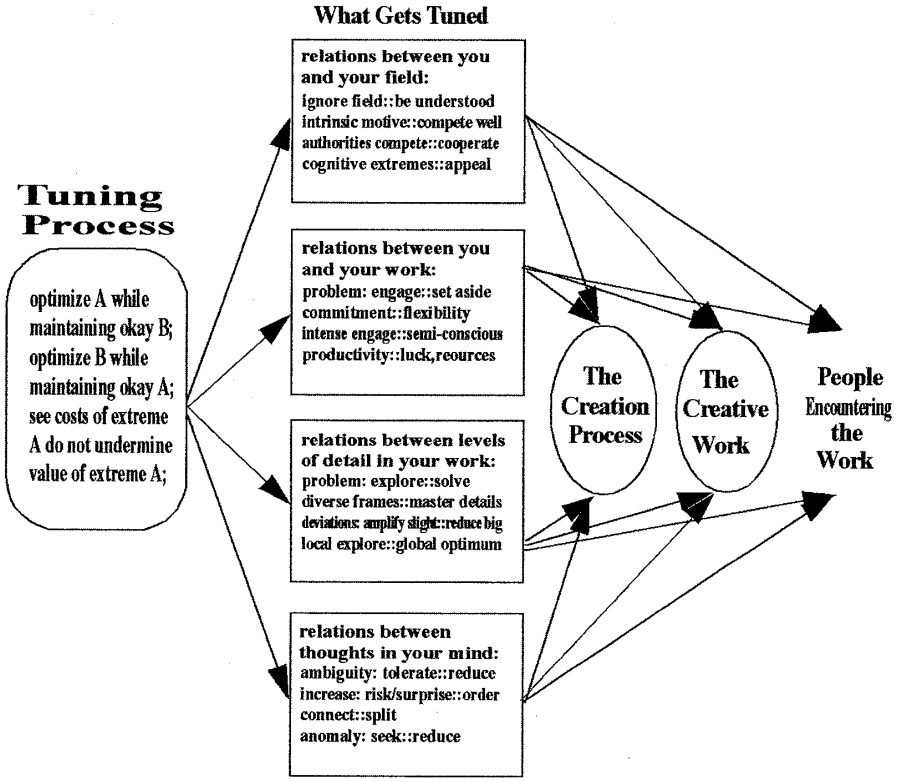
APPENDIX: 2nd Six Models: The Blend Models of Creativity

The Tuning Model of Creativity



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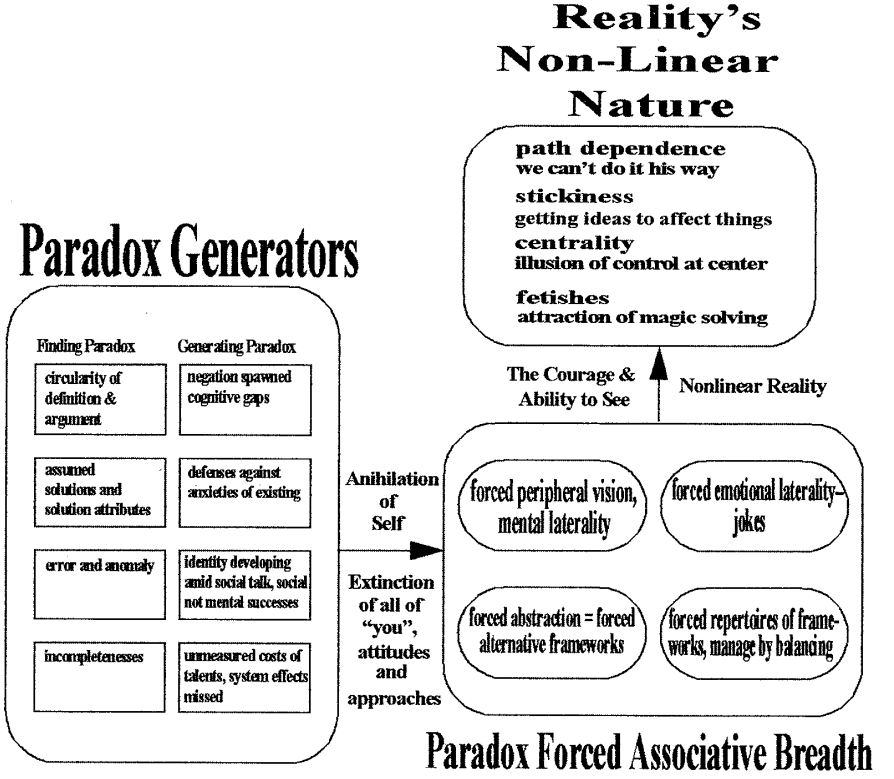
The Paradox Doorway Model of Creativity



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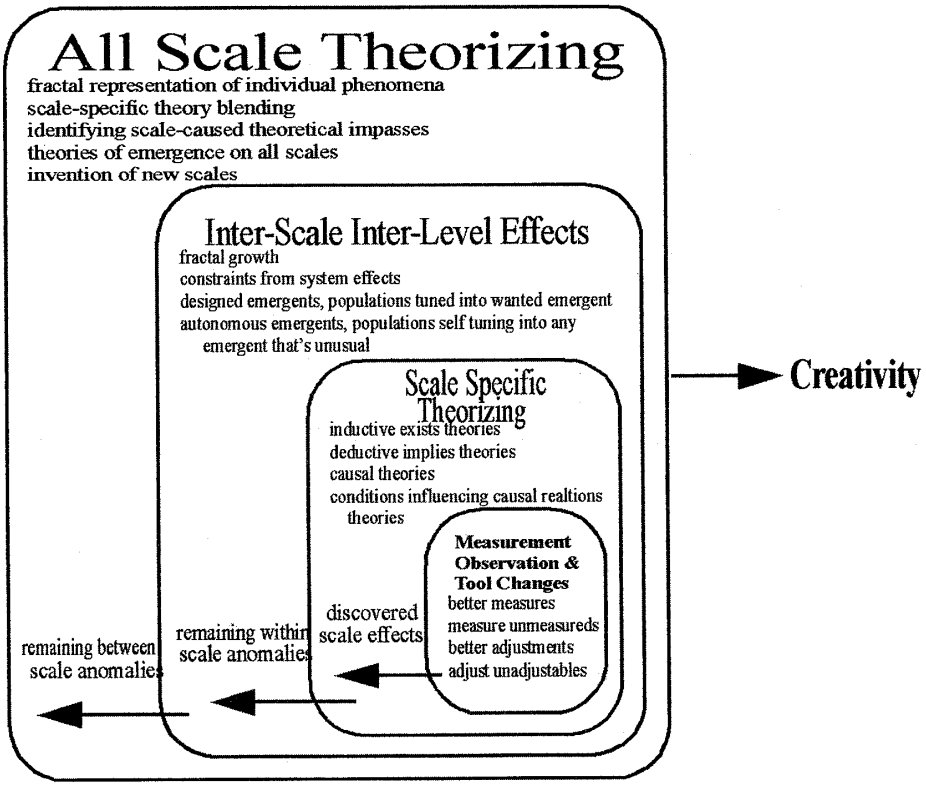
APPENDIX: 2nd Six Models: The Blend Models of Creativity

The Scale Blending Model of Creativity



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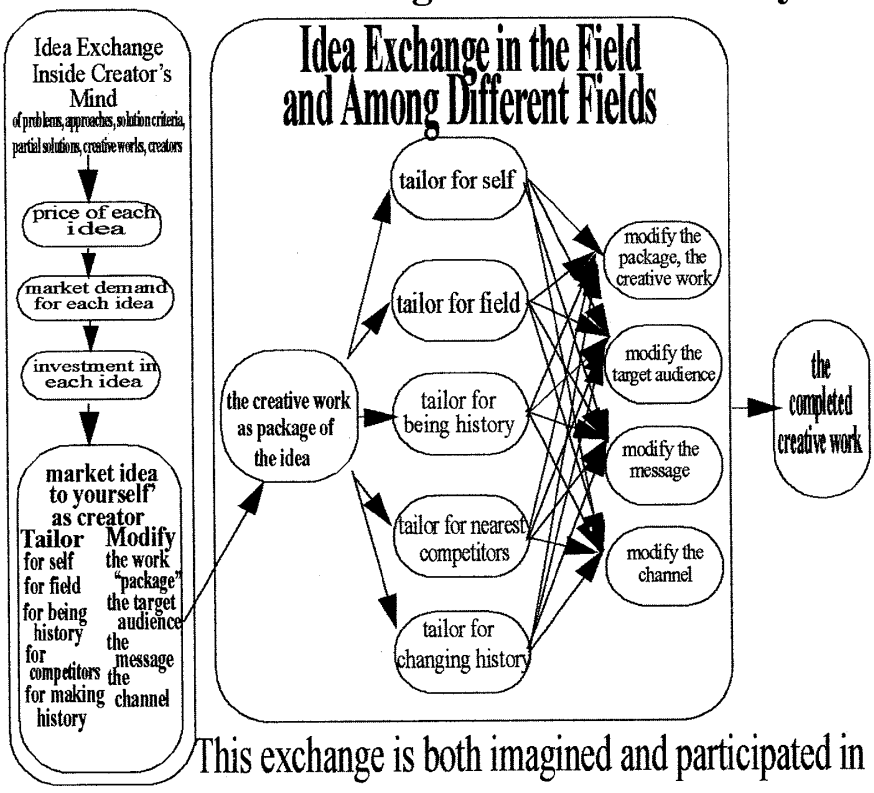
The Idea Marketing Model of Creativity



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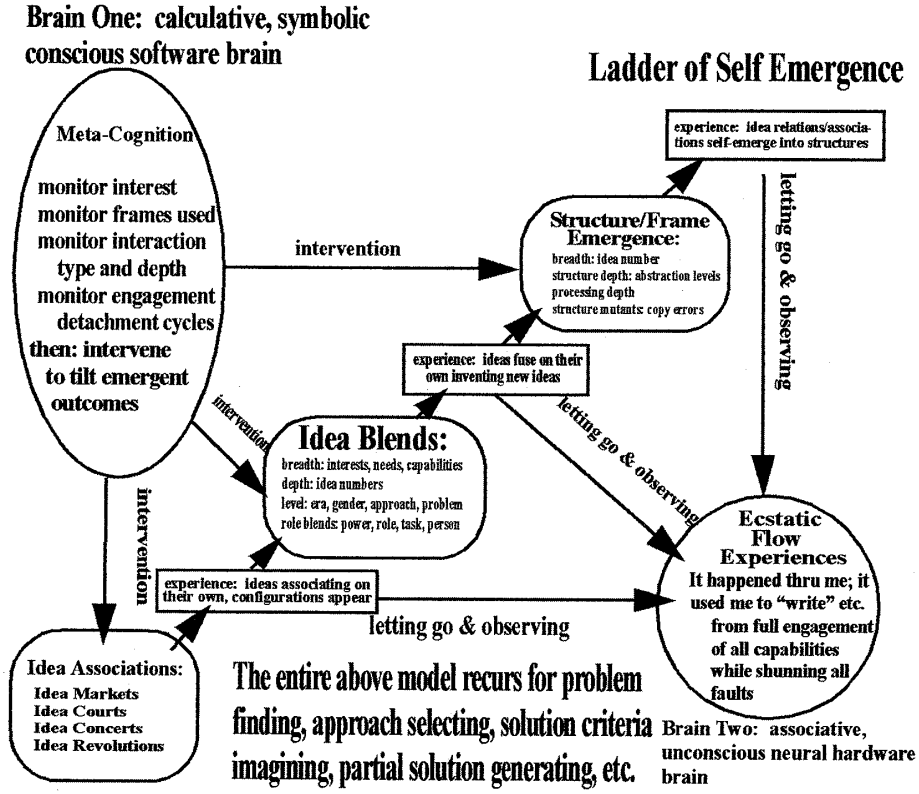
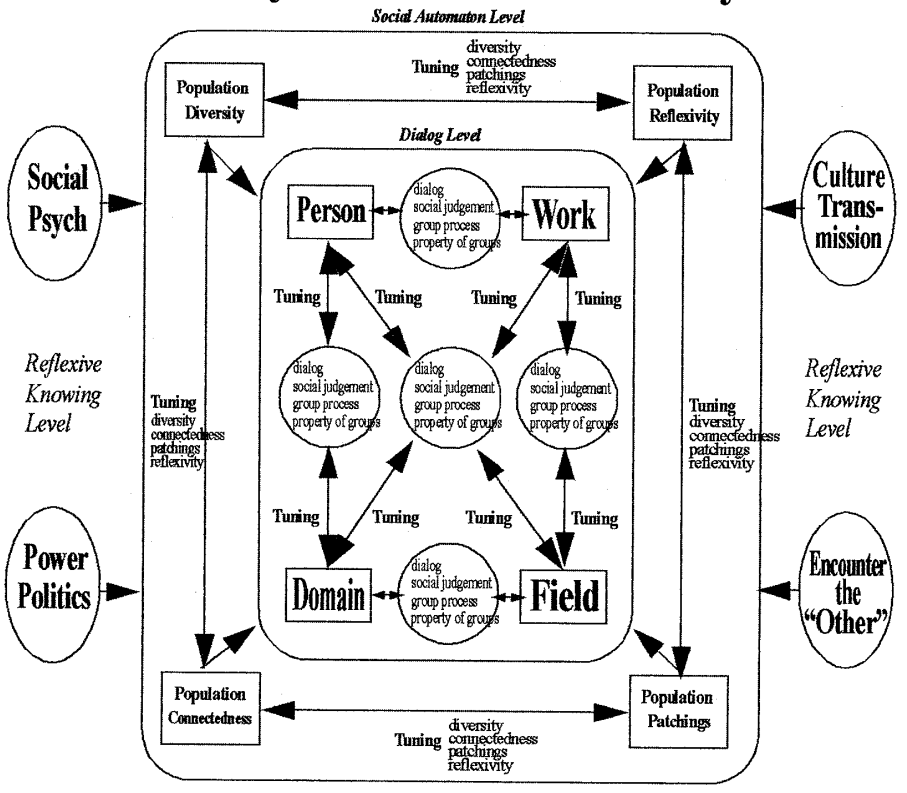
APPENDIX: 3rd Six Models: Group Models of Creativity

The Community of Ideas Model of Creativity



The System Model of Creativity



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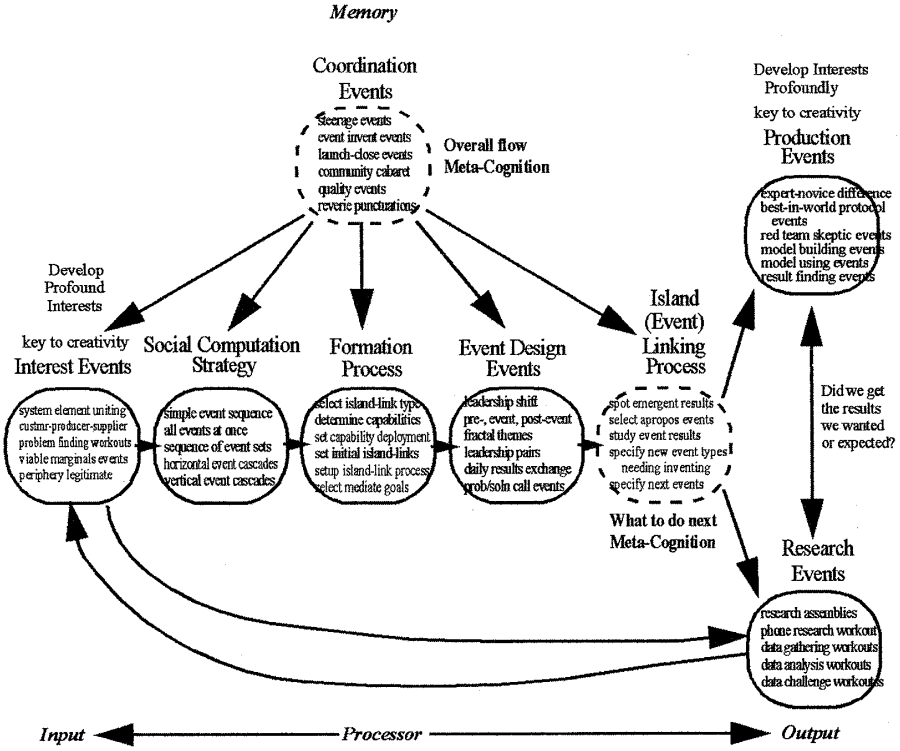
APPENDIX: 3rd Six Models: Group Models of Creativity

The Social Computation Model of Creativity

The Interest Development Process



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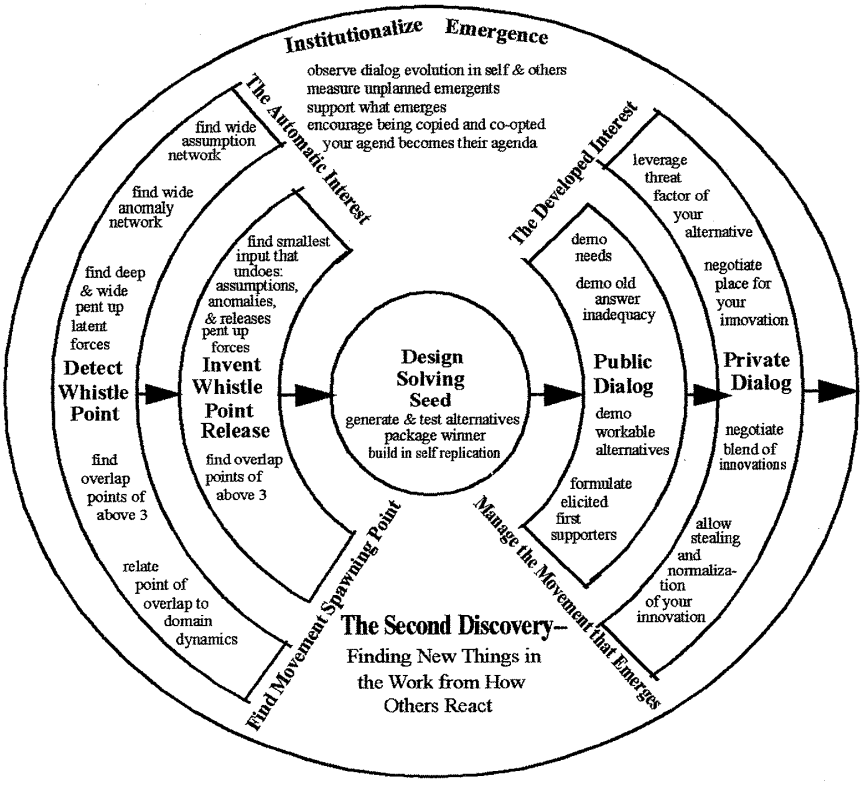
The Social Movement Model of Creativity



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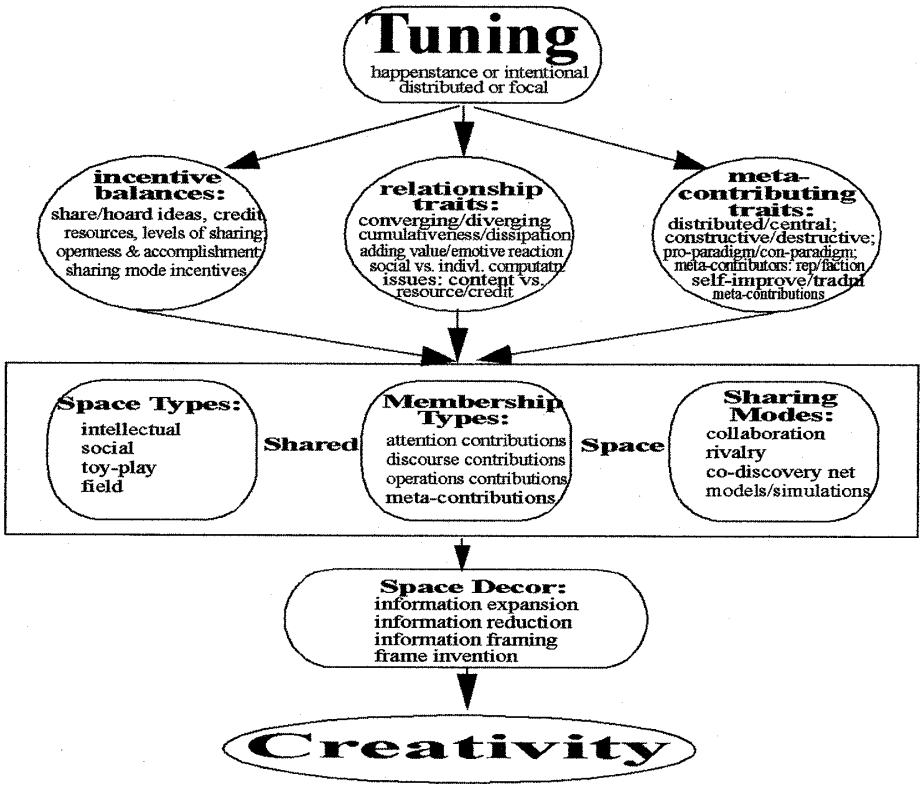
APPENDIX: 3rd Six Models: Group Models of Creativity

The Space Sharing Model of Creativity



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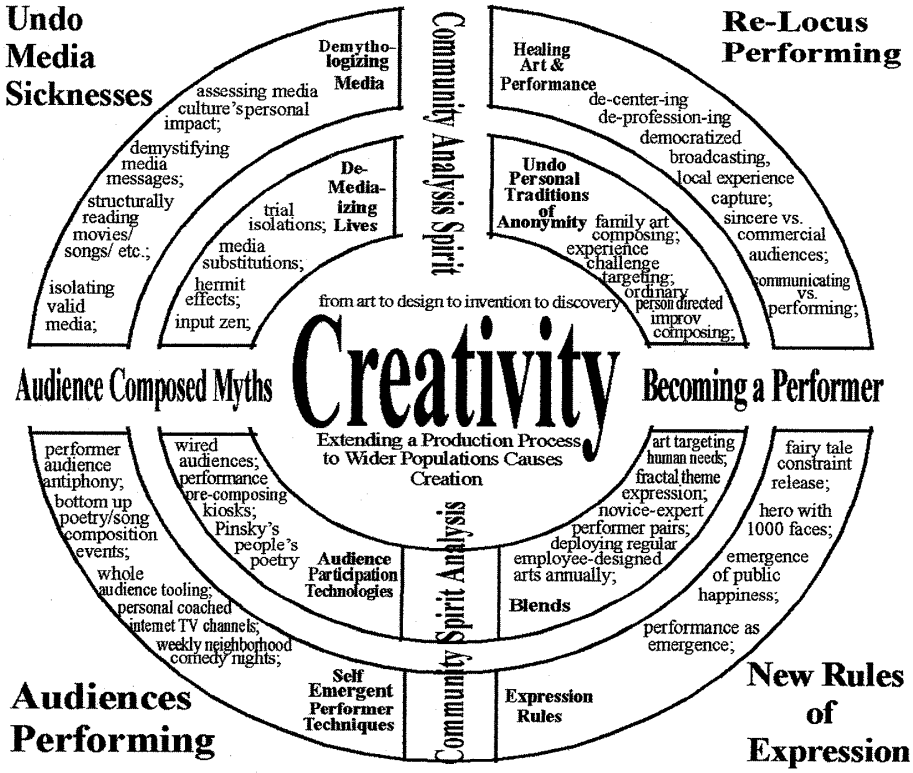
The Participatory Art and Design Model of Creativity



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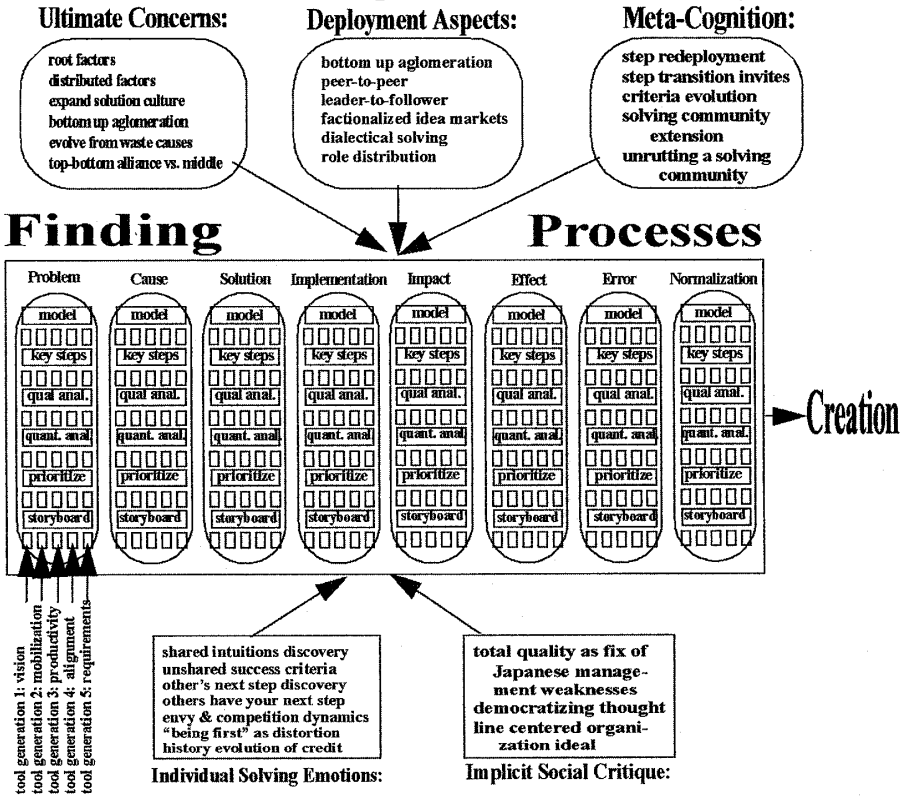
APPENDIX: 4th Six Models: Social Models of Creativity

The Mass Solving Model of Creativity



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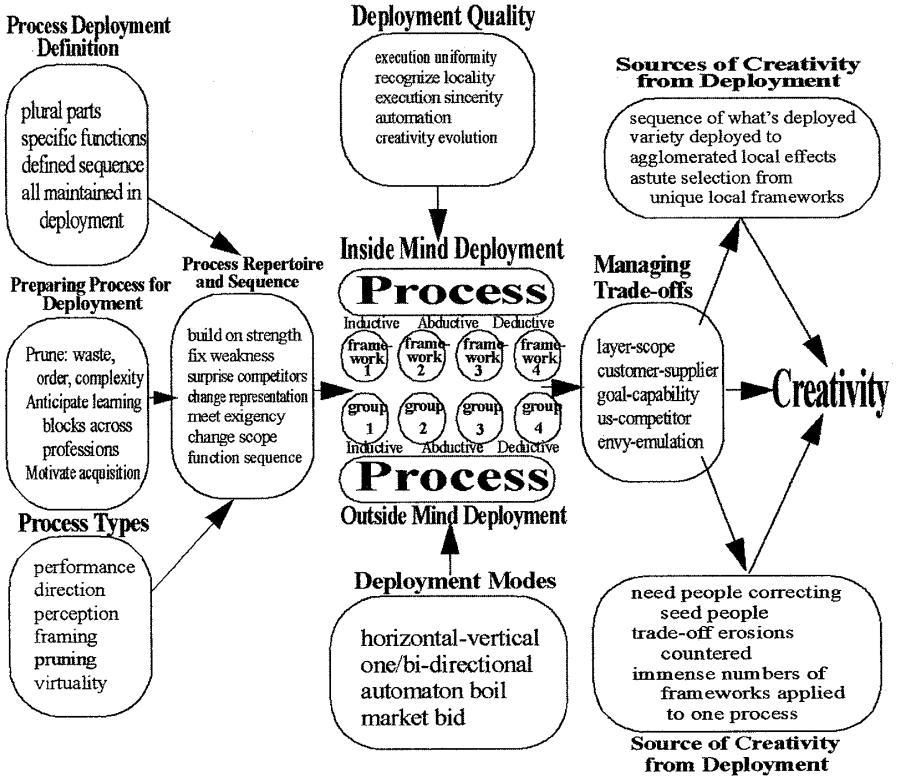
The Process Deployment Model of Creativity



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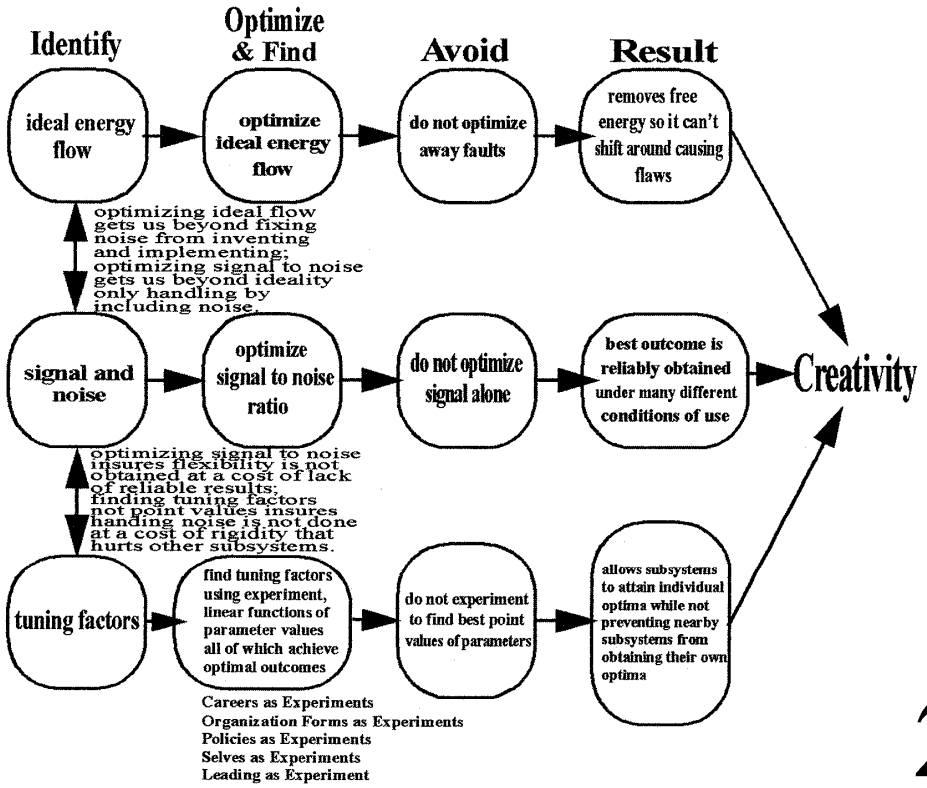
APPENDIX: 4th Six Models: Social Models of Creativity

The Optimize Ideal Flow Model of Creativity



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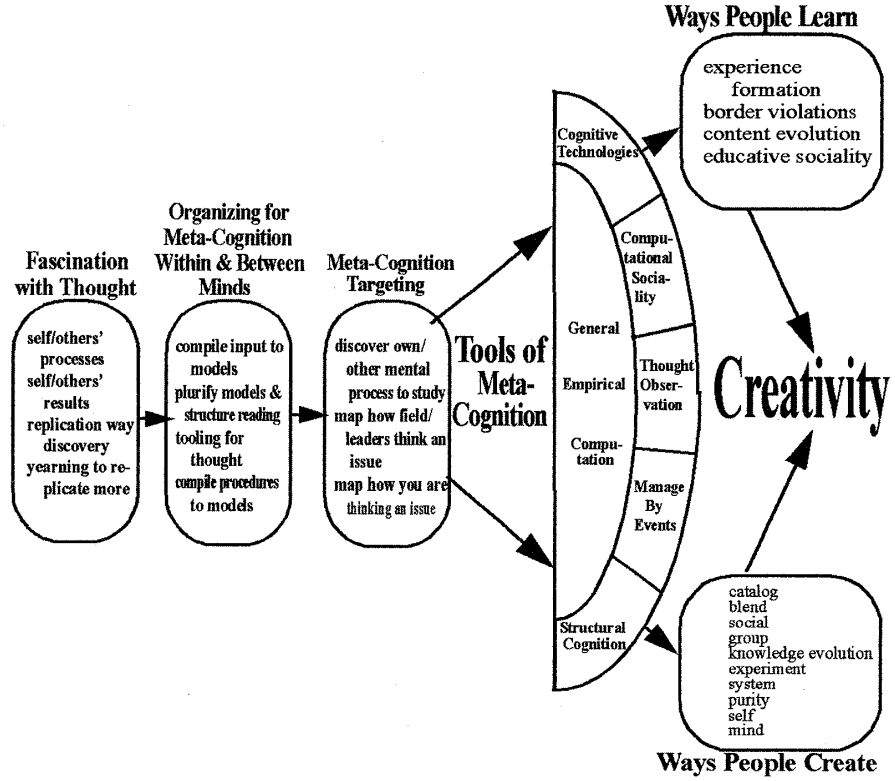
The Meta-Cognitive Organization Model of Creativity



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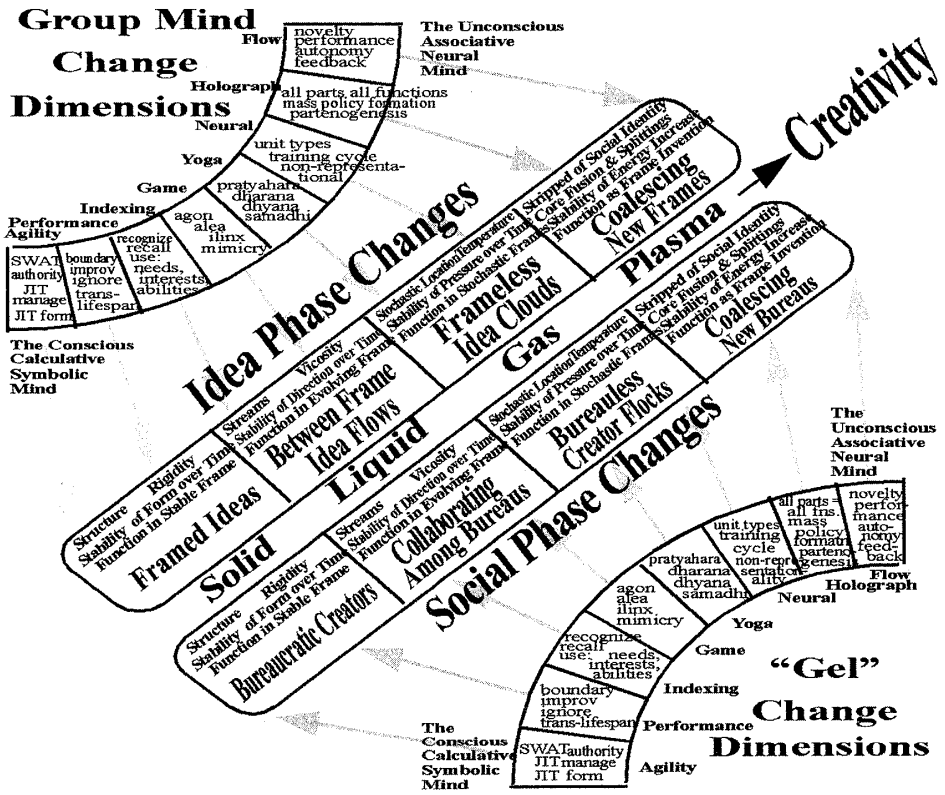
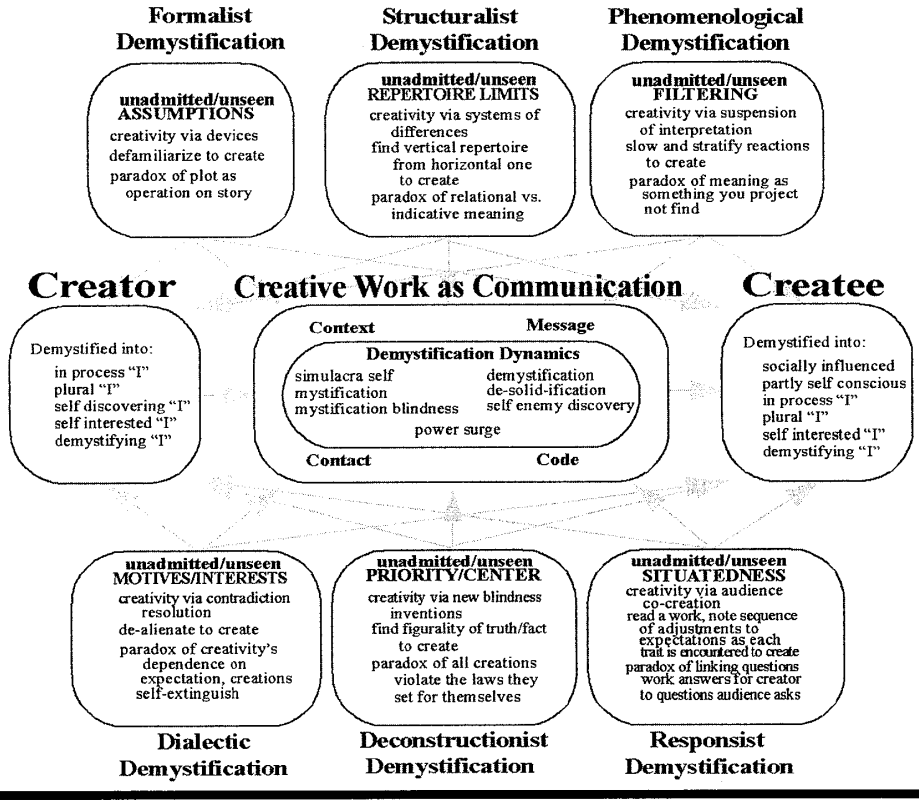
APPENDIX: 4th Six Models: Social Models of Creativity

The Social Connectionism Model of Creativity



The Demystification Model of Creativity



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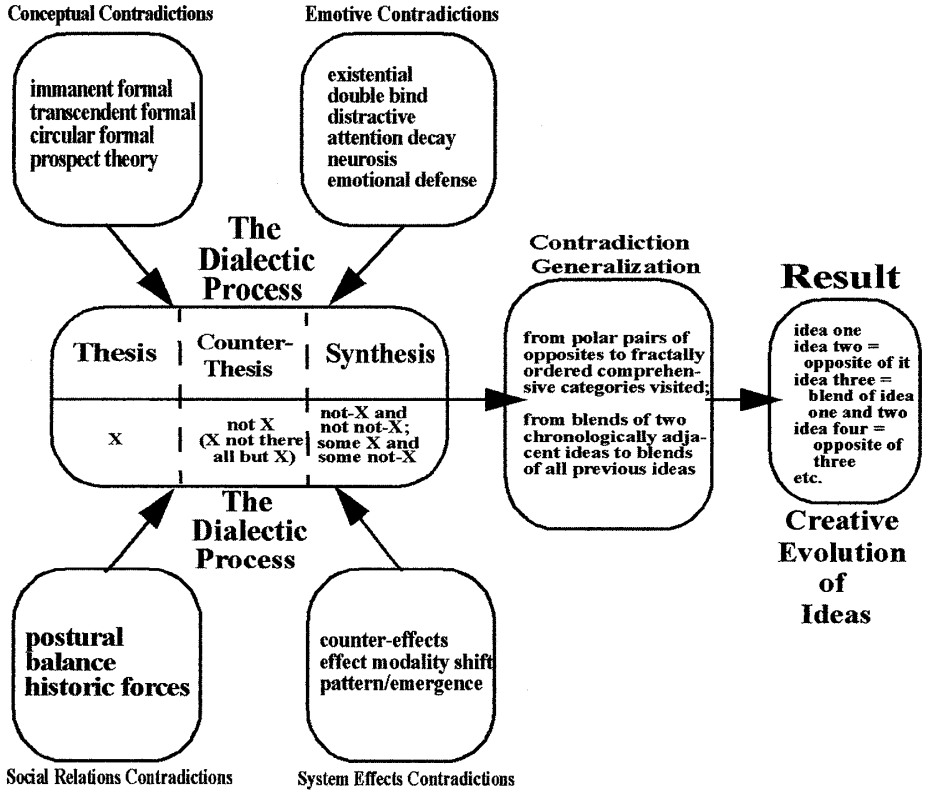
APPENDIX: 5th Six Models: Knowledge Evolution Models of Creativity

The Dialectic Model of Creativity



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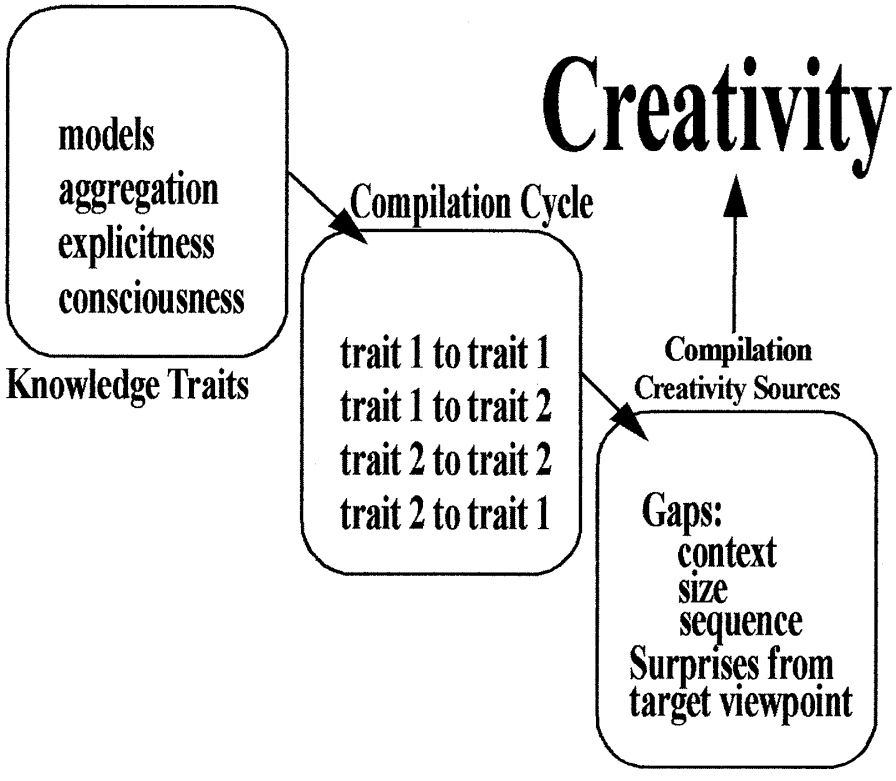
The Compilation Cycle Model of Creativity



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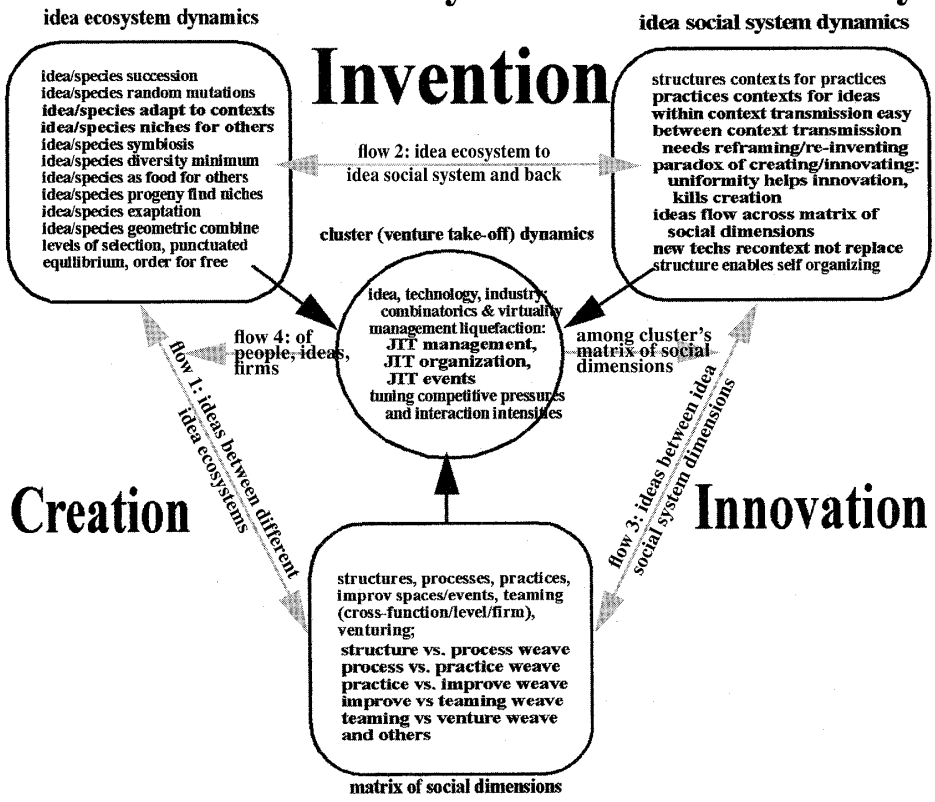
APPENDIX: 5th Six Models: Knowledge Evolution Models of Creativity

The Relocate Idea Ecosystem Model of Creativity



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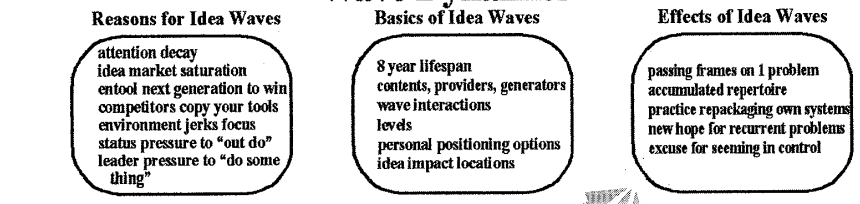
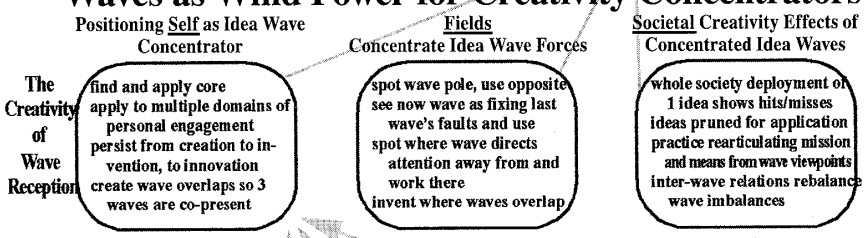
The Idea Waves Model of Creativity

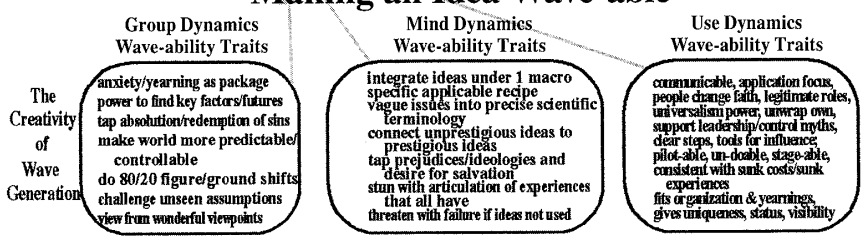
Wave Dynamics



Waves as Wind Power for Creativity Concentrators



Making an Idea Wave-able



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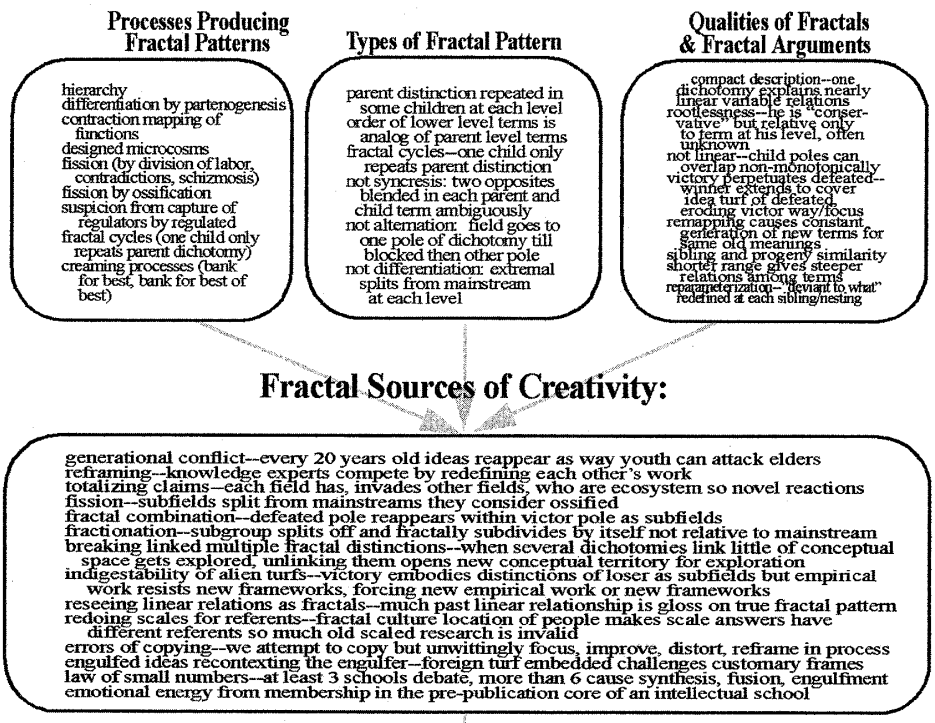
APPENDIX: 5th Six Models: Knowledge Evolution Models of Creativity

The Fractal Recurrence Model of Creativity



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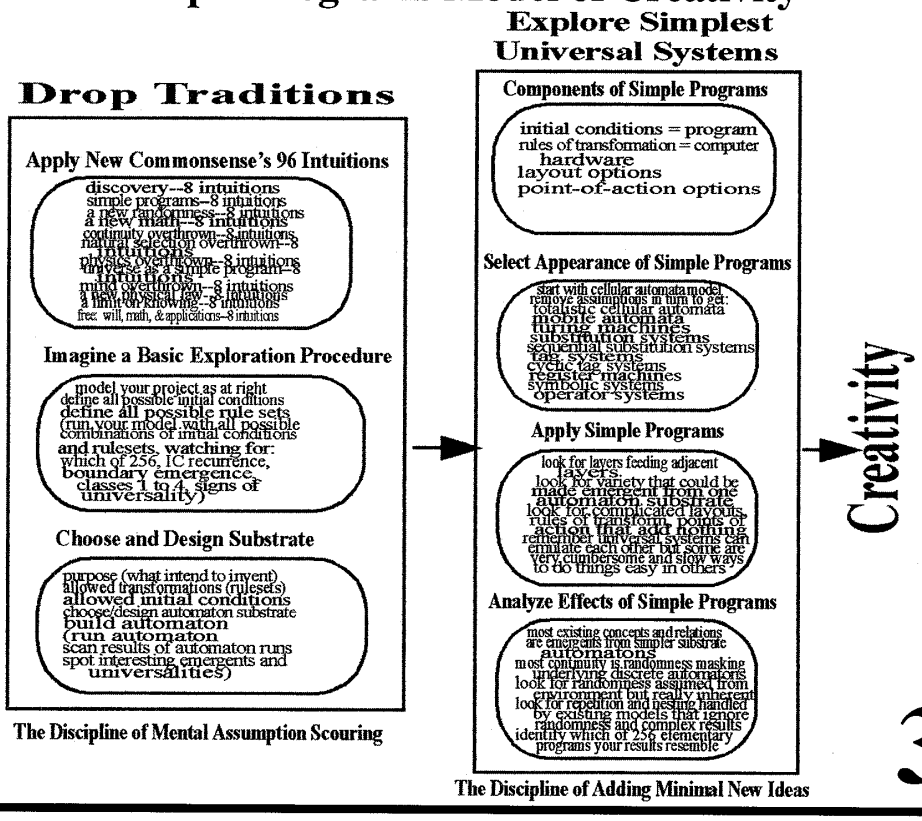
The Simple Programs Model of Creativity



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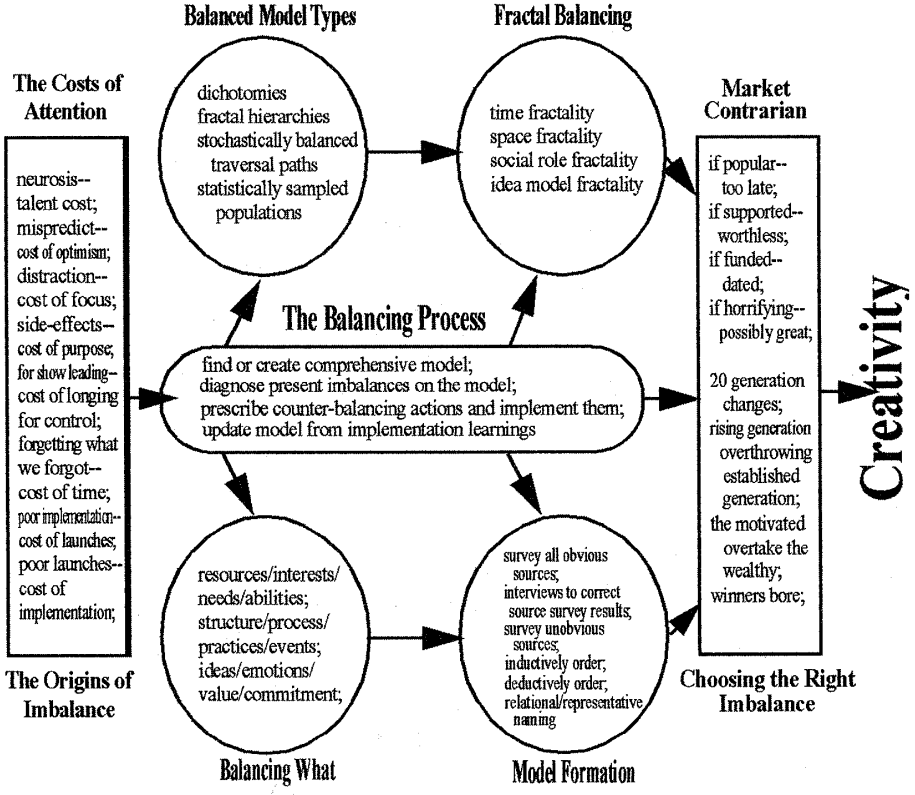
APPENDIX: 6th Six Models: Experiment Models of Creativity

The Create by Balancing Model of Creativity



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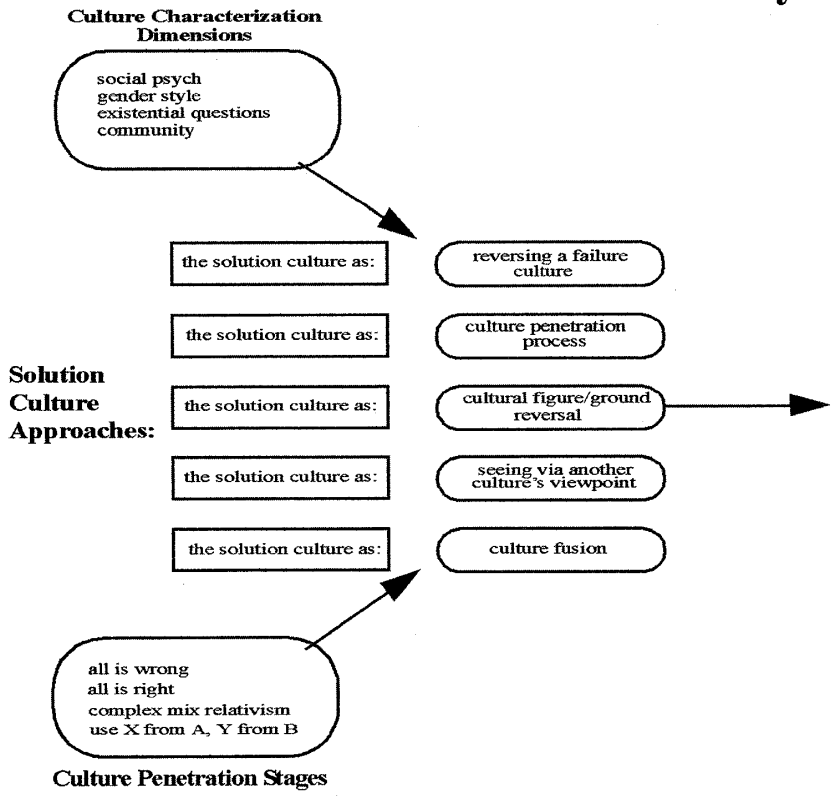
The Solution Culture Model of Creativity



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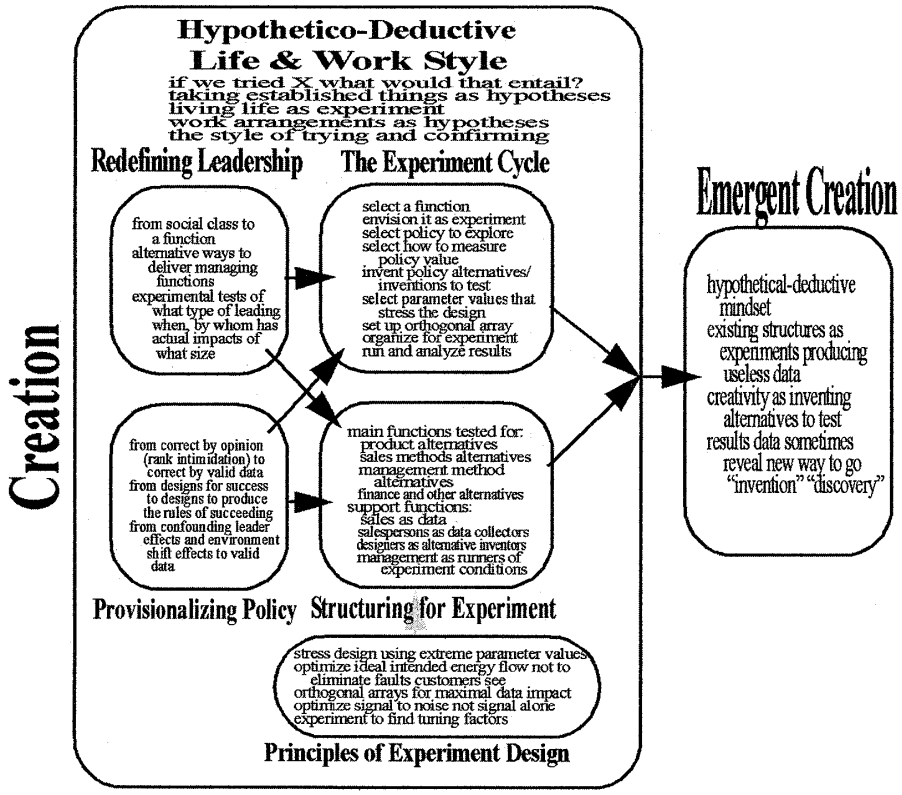
APPENDIX: 6th Six Models: Experiment Models of Creativity

The Policy By Experiment Model of Creativity



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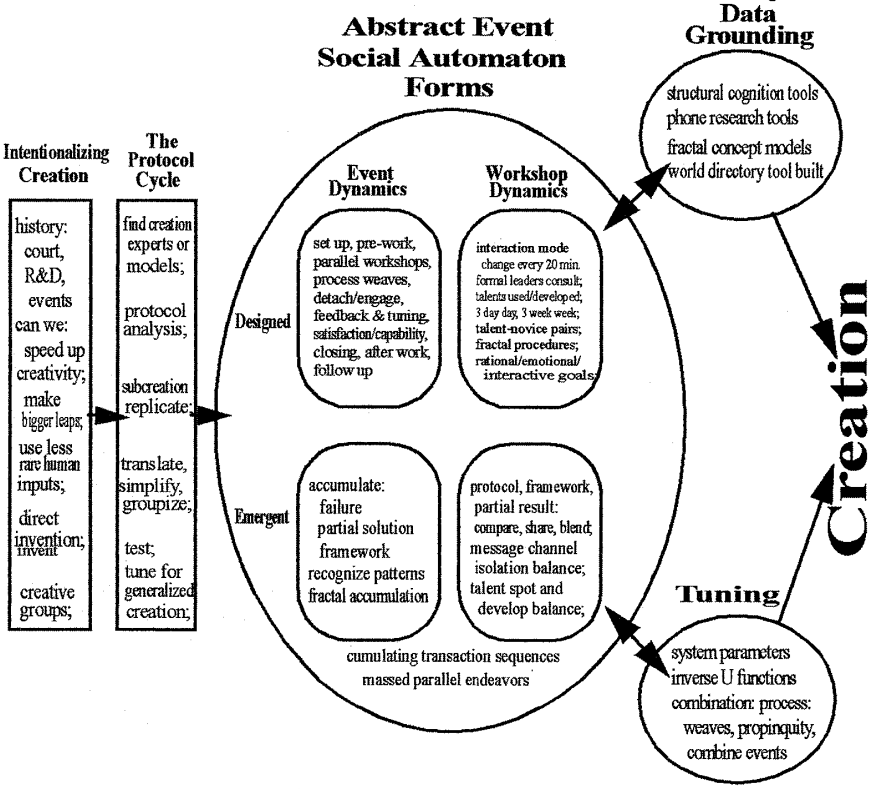
The Creation Event Model of Creativity



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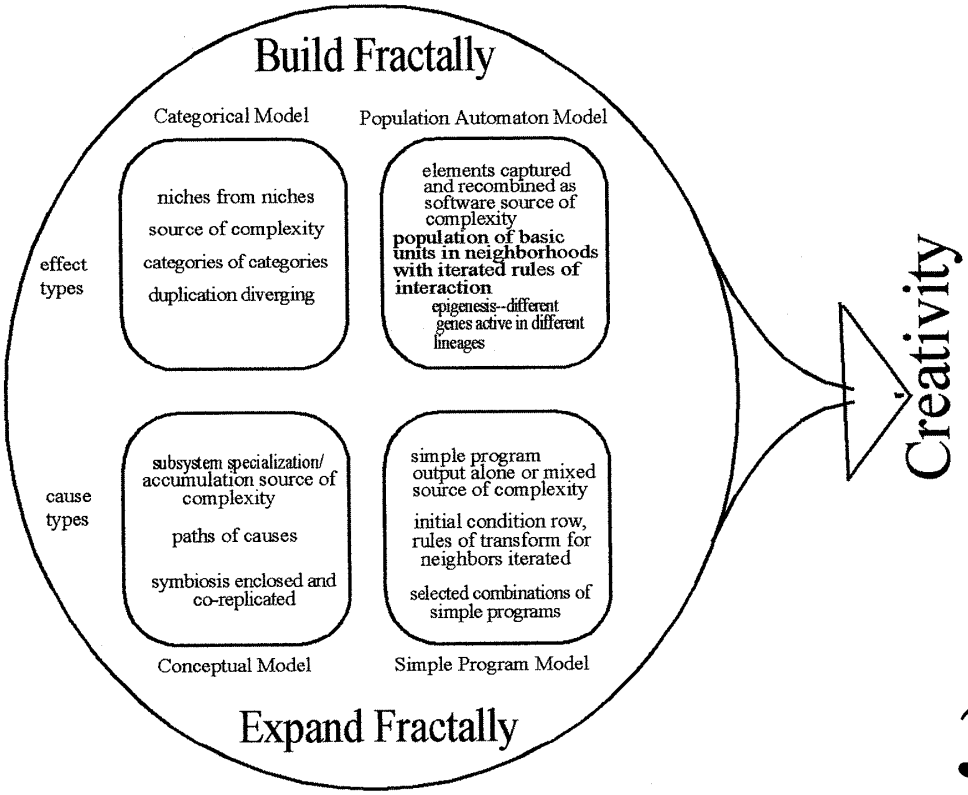
APPENDIX: 6th Six Models: Experiment Models of Creativity

The Fractal Model Expansion Model of Creativity



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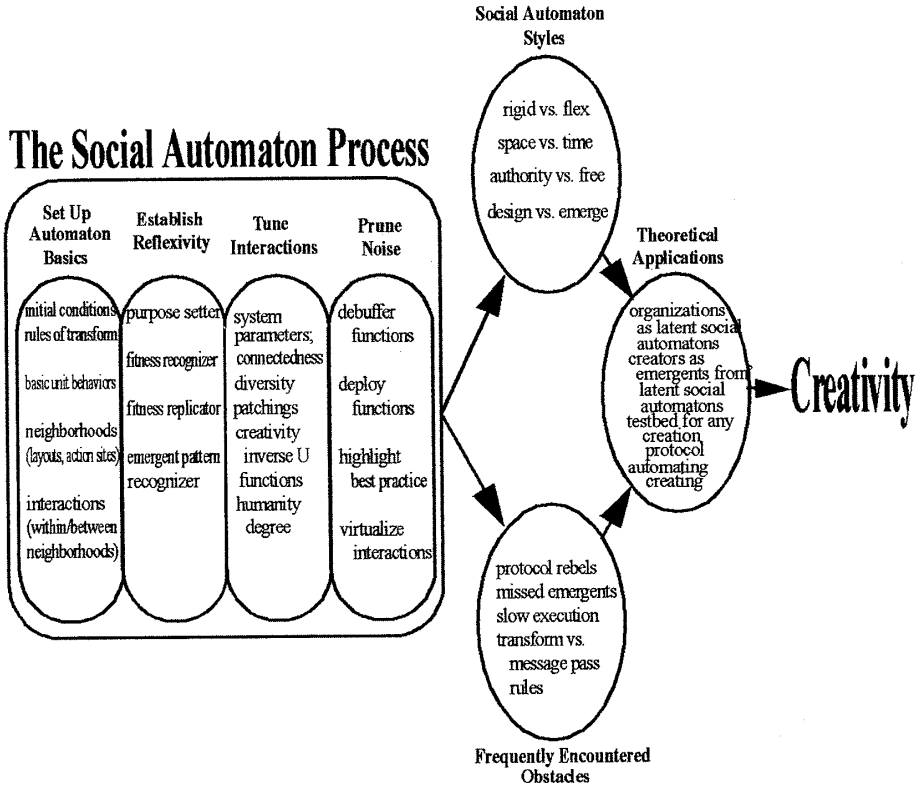
The Social Automaton Model of Creativity



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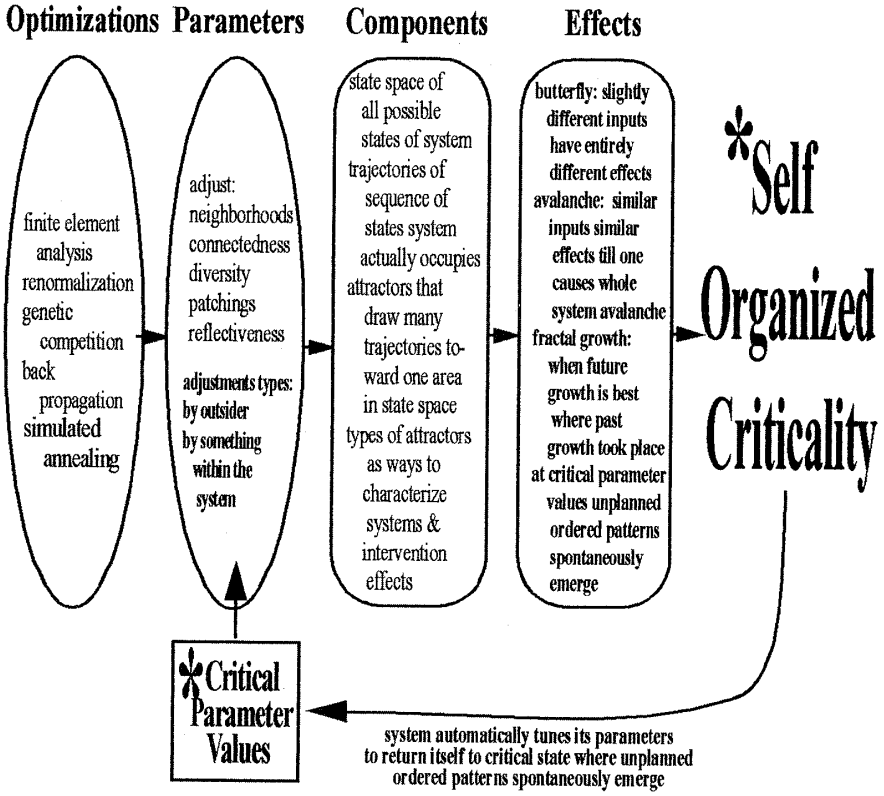
APPENDIX: 7th Six Models: System Models of Creativity

The Non-Linear Systems Model of Creativity



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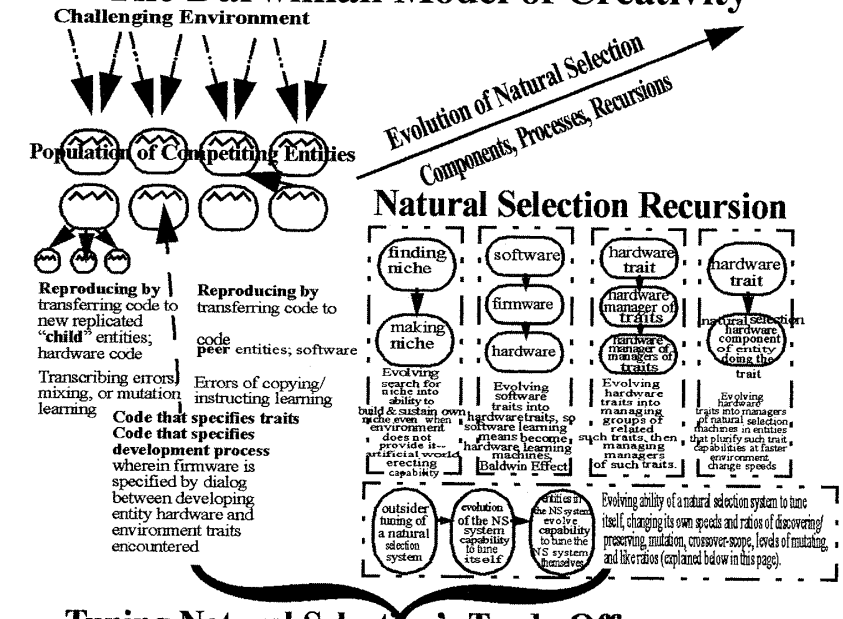
The Darwinian Model of Creativity



Tuning Natural Selection's Trade-Offs

Variation: enough mutation for adapting better not so much past learnings are dropped
Combination: enough mixing of differently developed traits to escape local optima without so much mixing that global optima are lost in excess variation
Selection: enough partiality in a solution and variety of partial solutions tried to learn solution phase space topology without so much partiality/variety that deep optima are missed
Reproduction: enough favor in replication for fittest items that overall population capabilities improve without so much favor that evolution stops and settles into local optimum
(note: this tuning can be done from outside or by a NS system evolving its own tuning-of-itself capabilities--organisms that increase their own mutation rates have been found recently)

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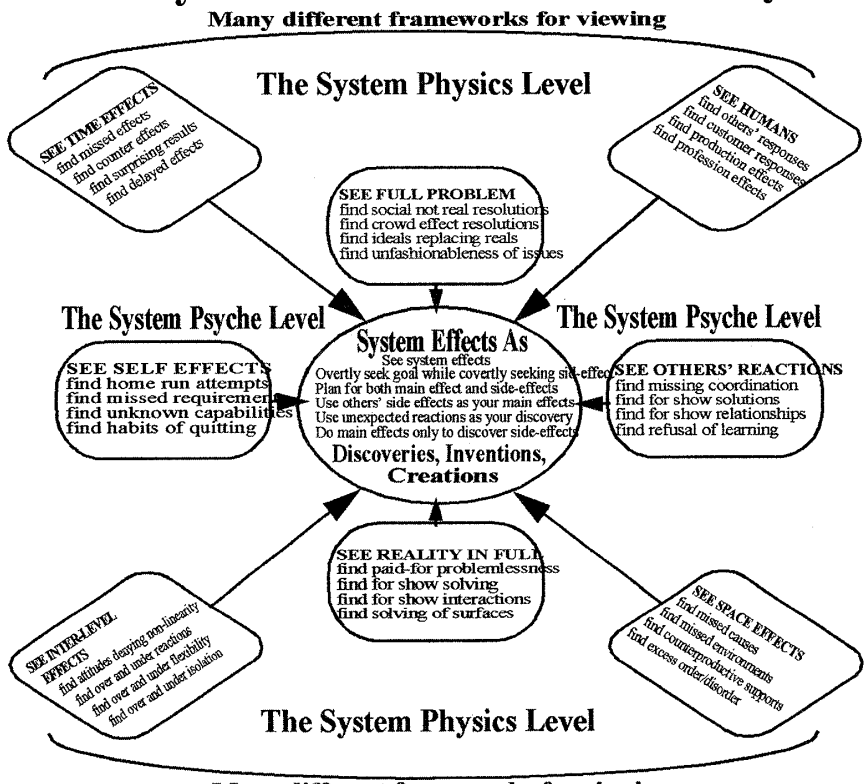
APPENDIX: 7th Six Models: System Models of Creativity

The System Effects Model of Creativity



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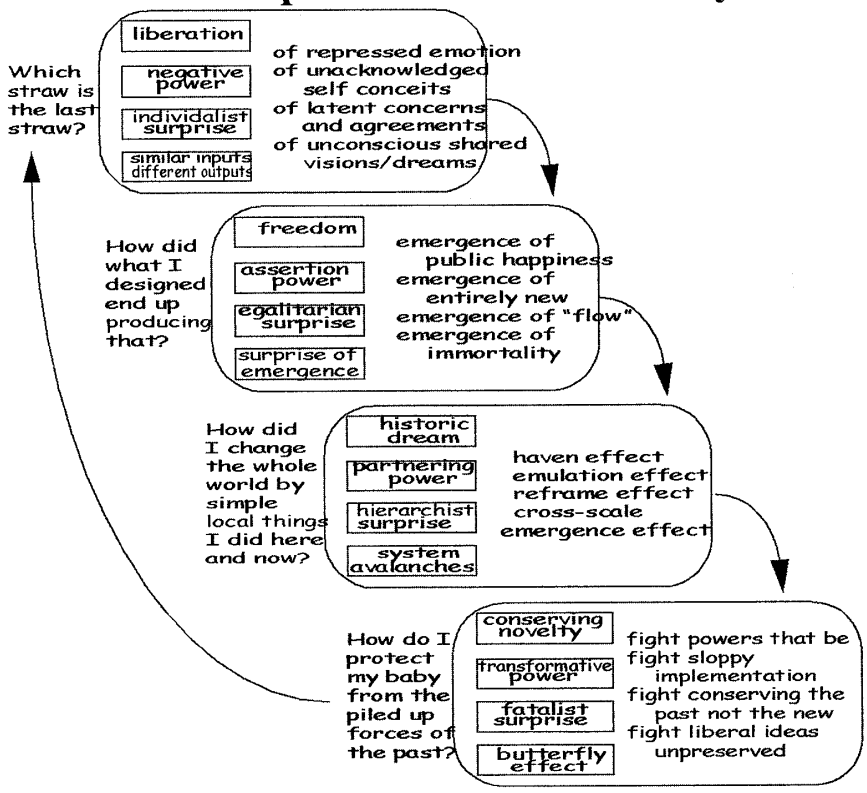
The Surprise Model of Creativity



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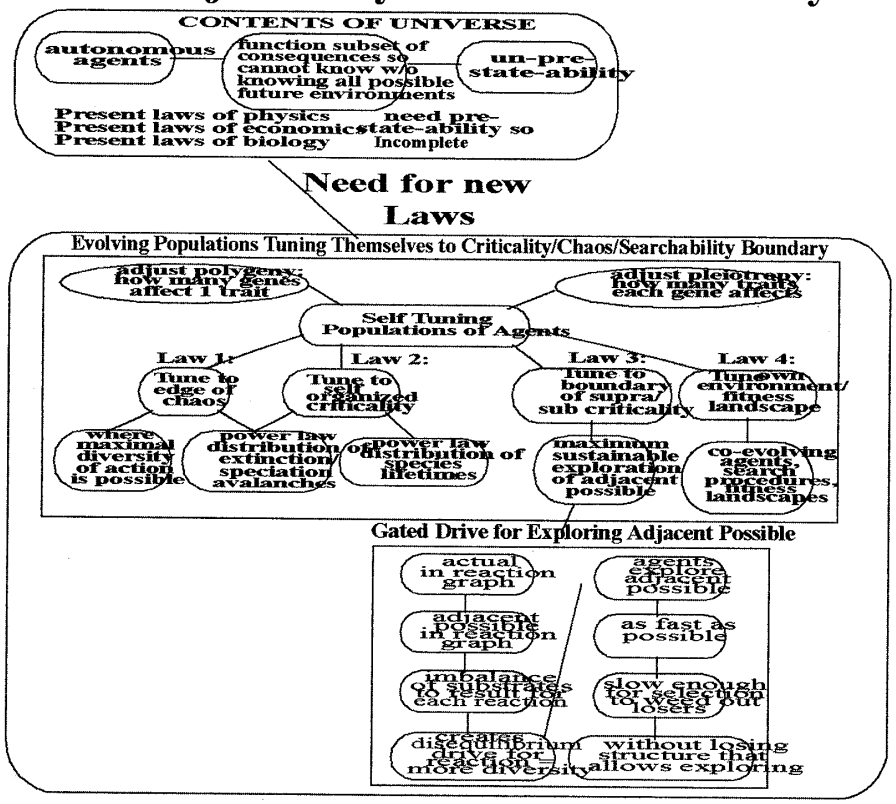
APPENDIX: 7th Six Models: System Models of Creativity

The Adjacent Beyond Model of Creativity



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The Population Automaton Model of Creativity

A Non-Linear System Handling Non-Linear Systems Fractally on Social Levels

3 on Plural Social Levels

1 Set up Genetic Automatons: Non-Linear System Dynamics

trajectories in state spaces
attractors
edge of chaos critical points
fractal avalanches
order for free
spontaneous emergence of unplanned pattern
universal non-linearities

Social Non-Linearity

2 Tune Automaton till Emergence Human Nature: Paradox Generators

negation: simultaneous opposites
hubris: broken illusions
feedbacks: chicken and egg delimmas
parallel projects: focus from plural engagements
psychic non-linearities

Psychic Non-Linearity

Social Levels

Genetic Automaton Levels:	Paradox Generator Levels:	Application Automaton/Fields Levels:
among thoughts Emergent **Insights**	negation: simultaneous opposites	thoughts: Structural Cognition
among failed solution attempts Emergent **Solutions/ Works**	hubris: broken illusions	emotional reactions: Group Dynamics, Emotional Intelligence
among voices/works in a field Emergent **Creators**	feedbacks: chicken and egg delimmas	moves & improvs in performance: Leadership, Innovation, High Performance
among domains Emergent **Domains**	parallel projects: focus from plural engagements	parts of organizations: Org Learning Knowledge Management, Network Economics

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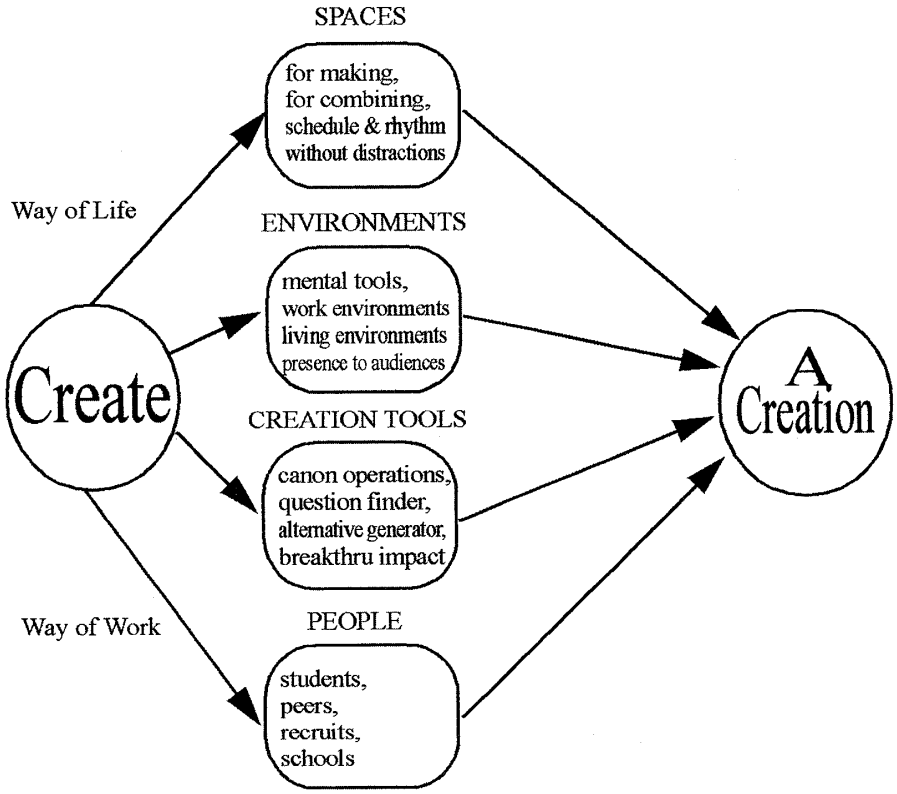
APPENDIX: 8th Six Models: Purity Models of Creativity

The Subcreations Model of Creativity



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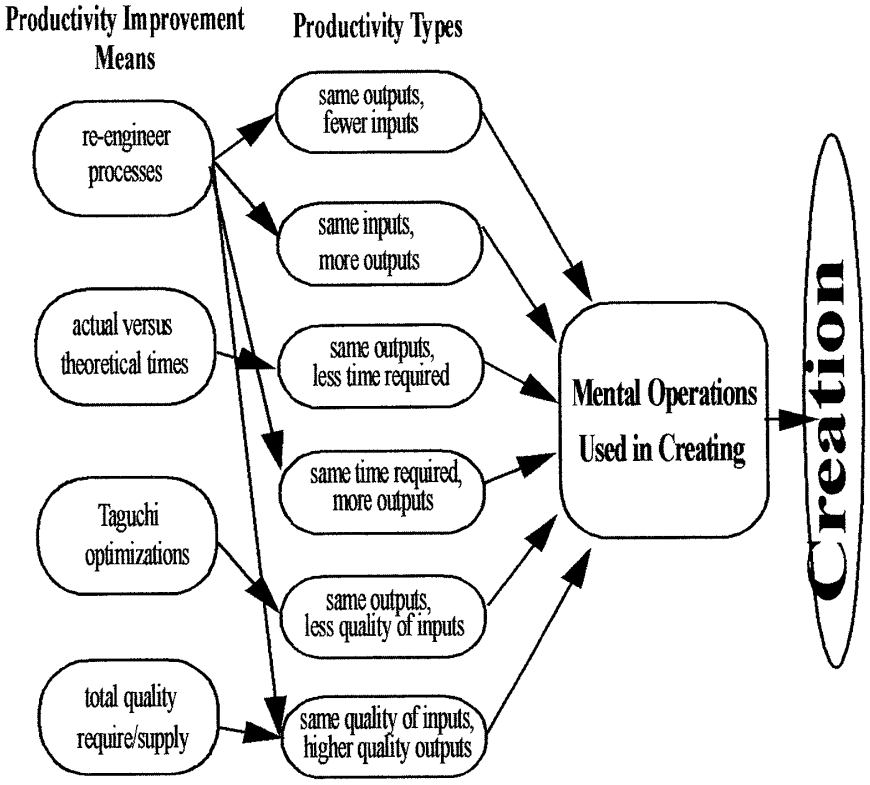
The Poductivity Model of Creativity



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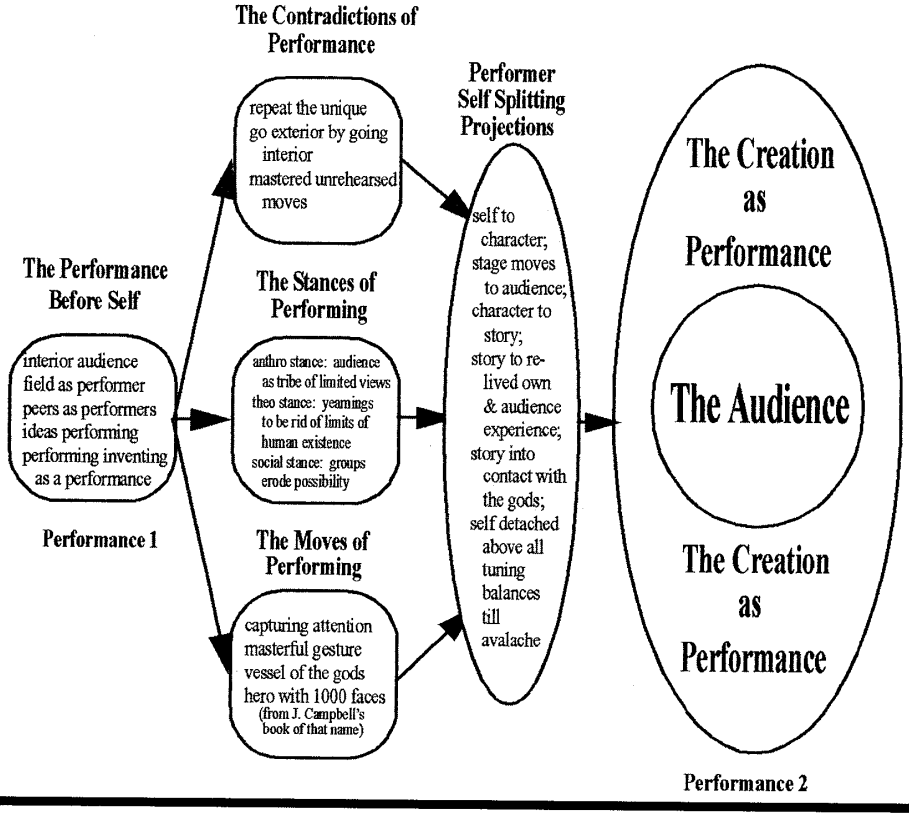
APPENDIX: 8th Six Models: Purity Models of Creativity

The Performance Model of Creativity



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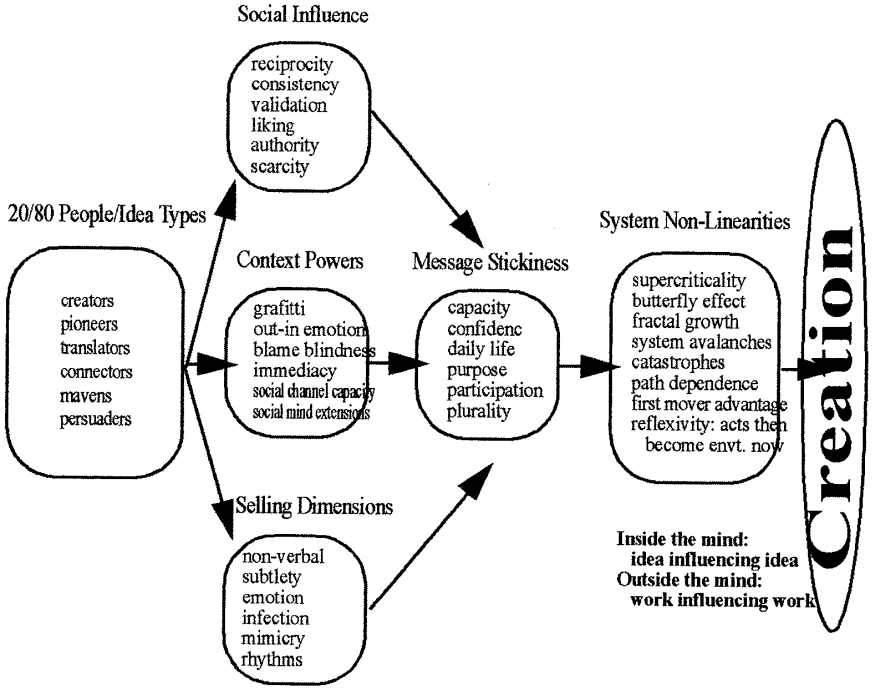
The Influence Model of Creativity



This process done twice: once inside your mind where ideas influence you and other ideas, then, again, when you fashion a work to embody ideas you come up with so the work influences a field and other works in it including future works by you and others.

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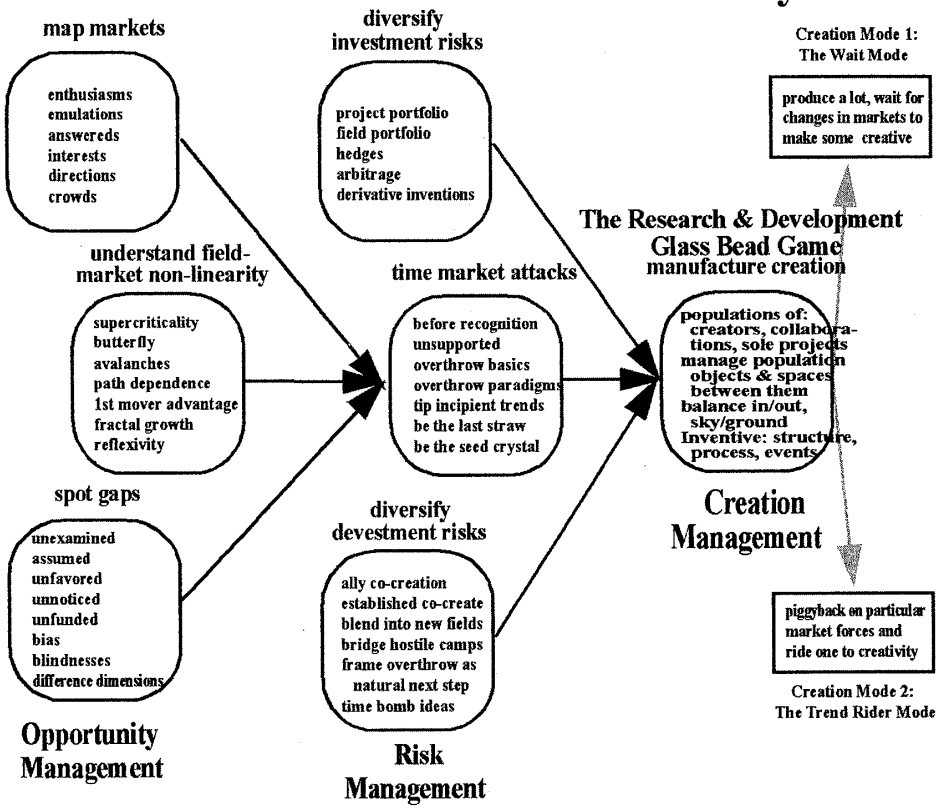
APPENDIX: 8th Six Models: Purity Models of Creativity

The Investment Model of Creativity



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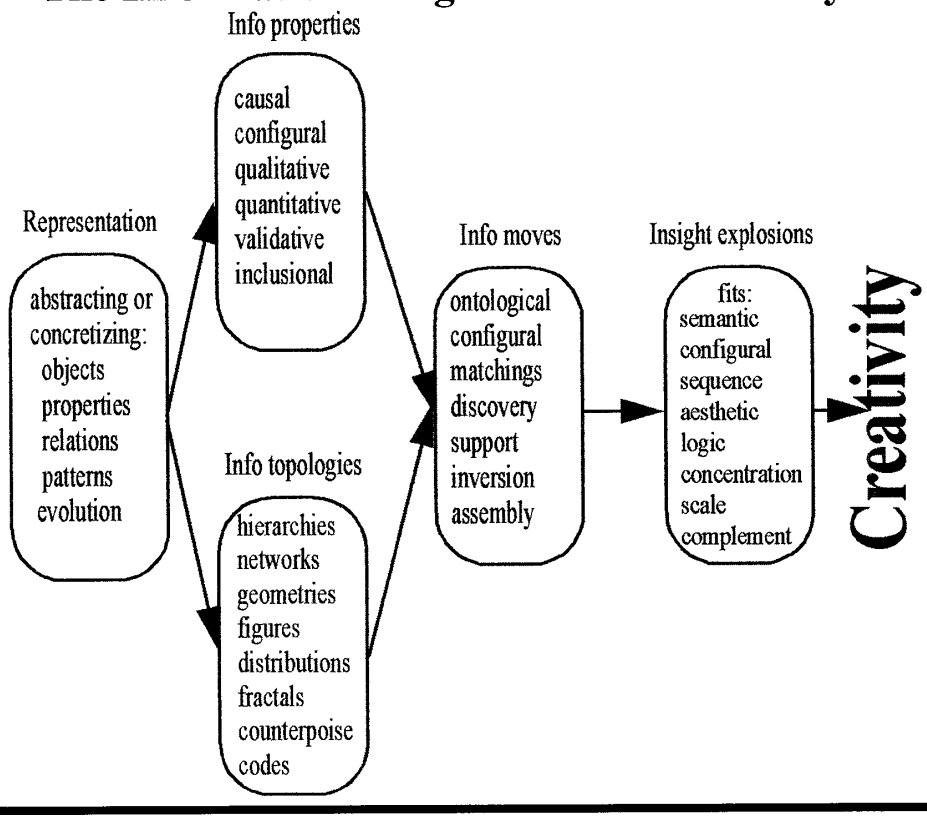
The Information Design Model of Creativity



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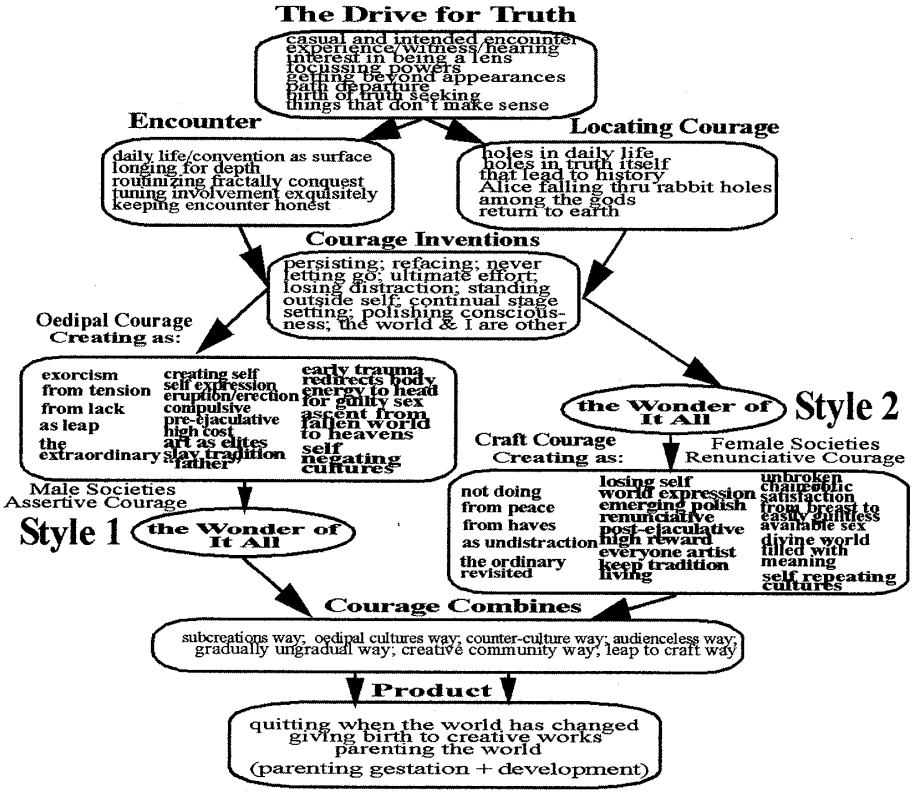
APPENDIX: 9th Six Models: Self Models of Creativity

The Courage Model of Creativity



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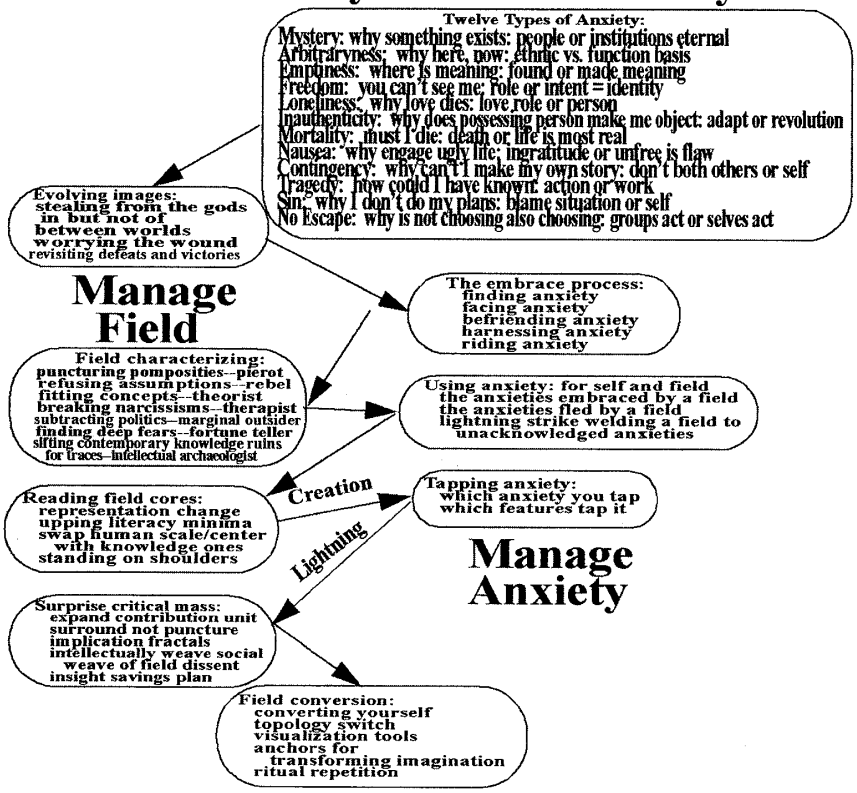
The Anxiety Model of Creativity



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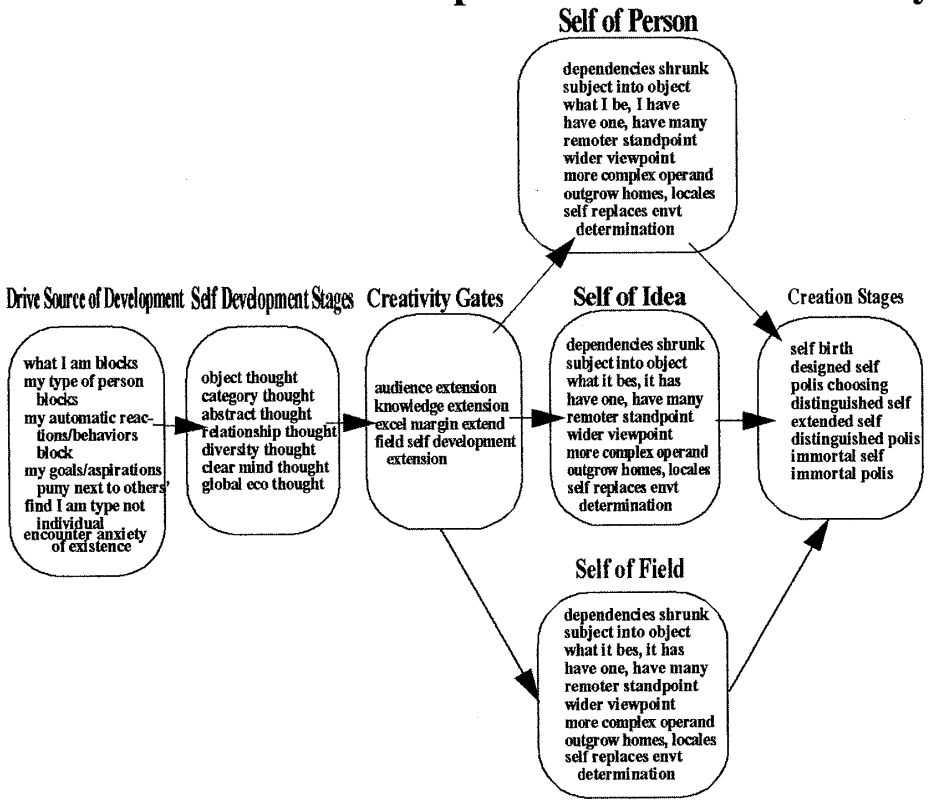
APPENDIX: 9th Six Models: Self Models of Creativity

The Extended Self Development Model of Creativity



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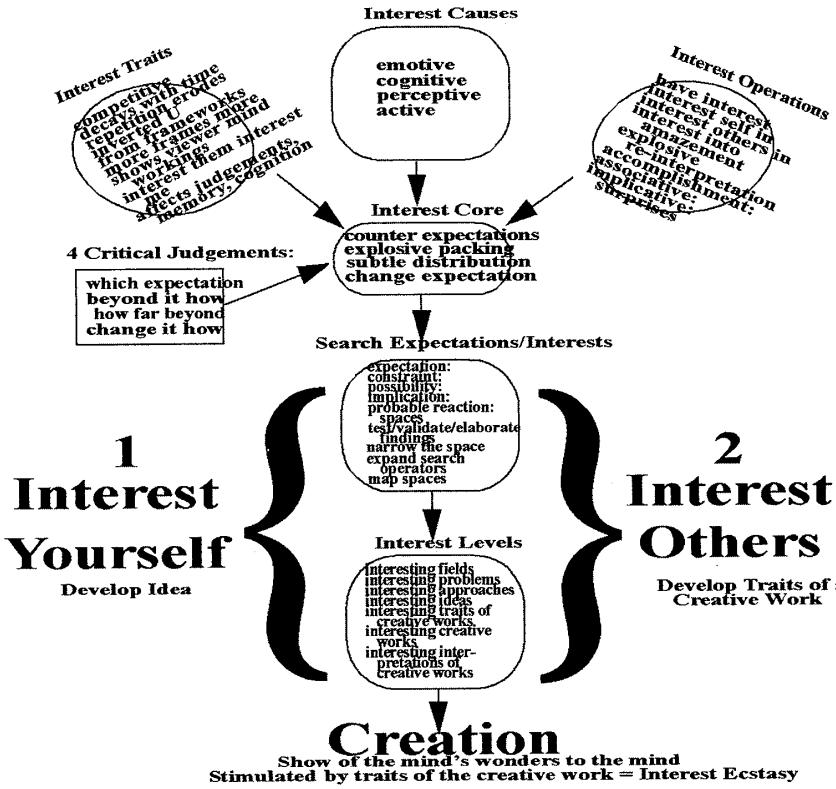
The Interest Ecstasy Model of Creativity



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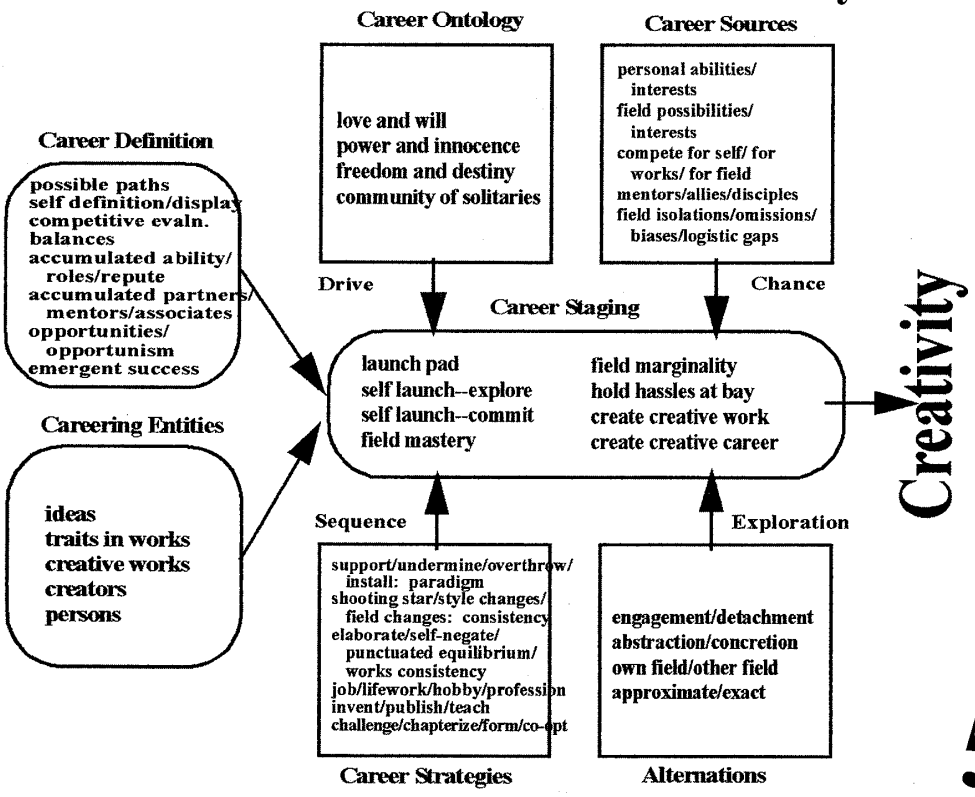
APPENDIX: 9th Six Models: Self Models of Creativity

The Career Invention Model of Creativity



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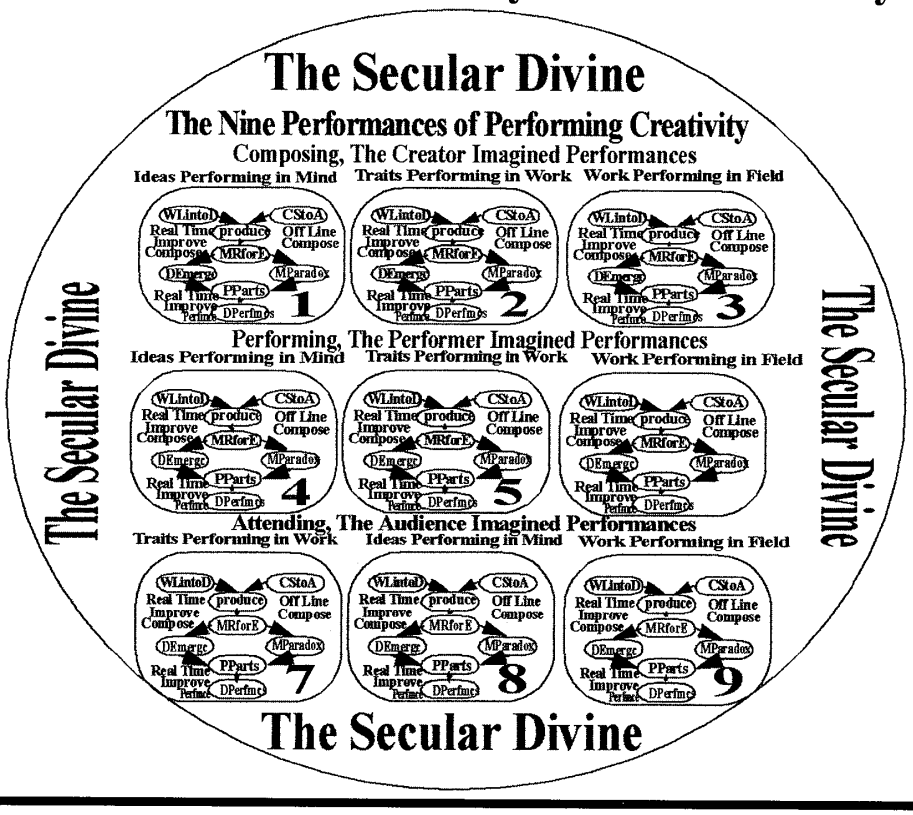
The Performance Creativity Model of Creativity



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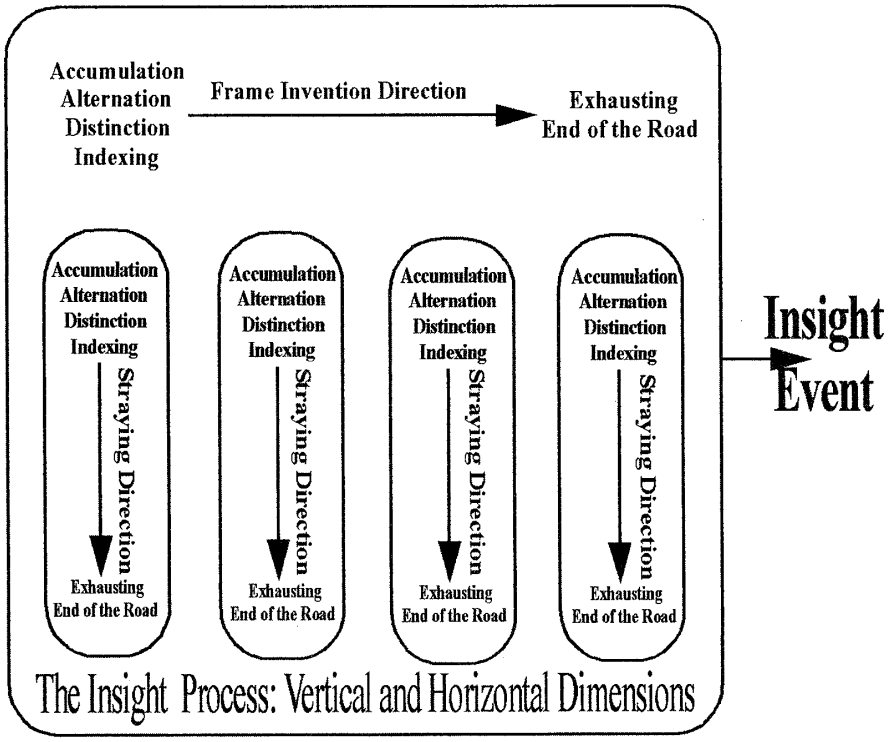
APPENDIX: 10th Six Models: Mind Models of Creativity

The Insight Model of Creativity

Managing Minds: Calculative & Associative



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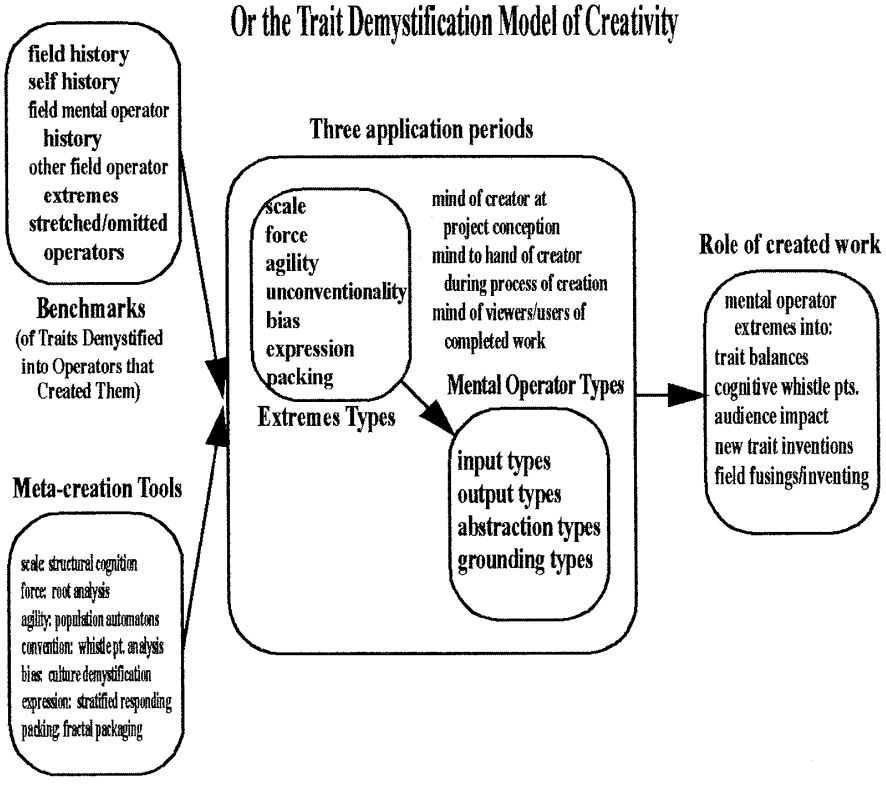
The Cognitive Operator Extremes Model of Creativity

Or the Trait Demystification Model of Creativity



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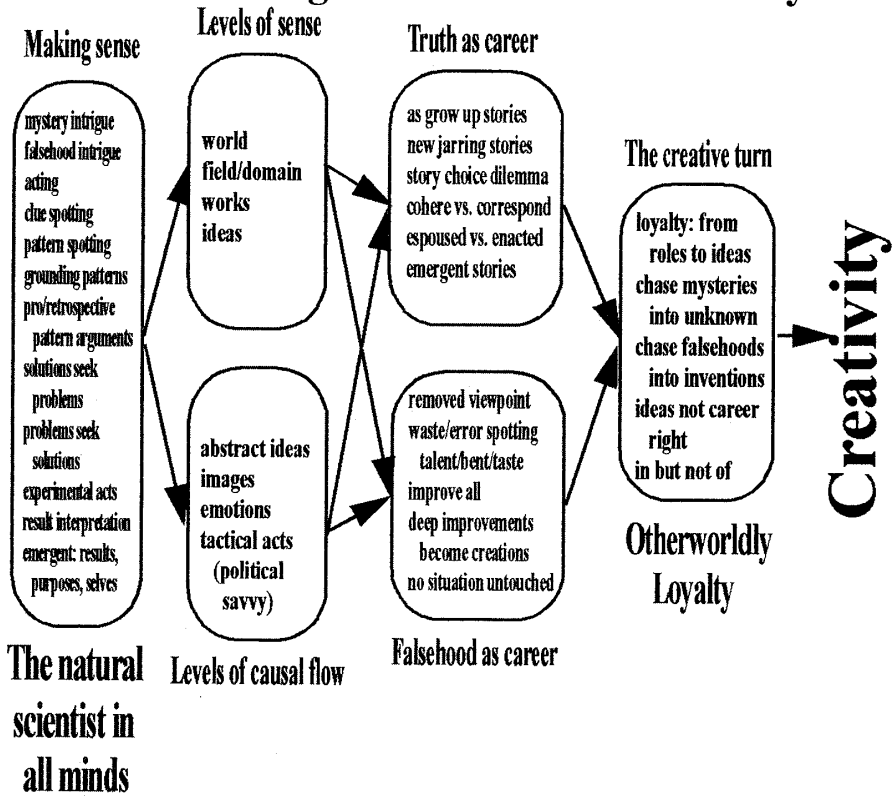
APPENDIX: 10th Six Models: Mind Models of Creativity

The Making Sense Model of Creativity



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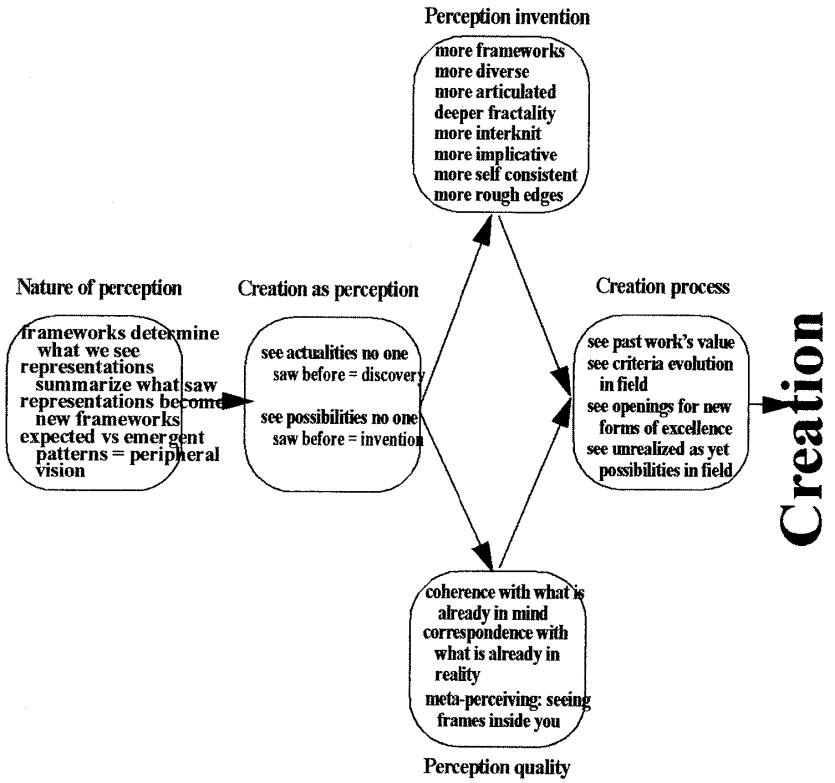
The Perception Invention Model of Creativity



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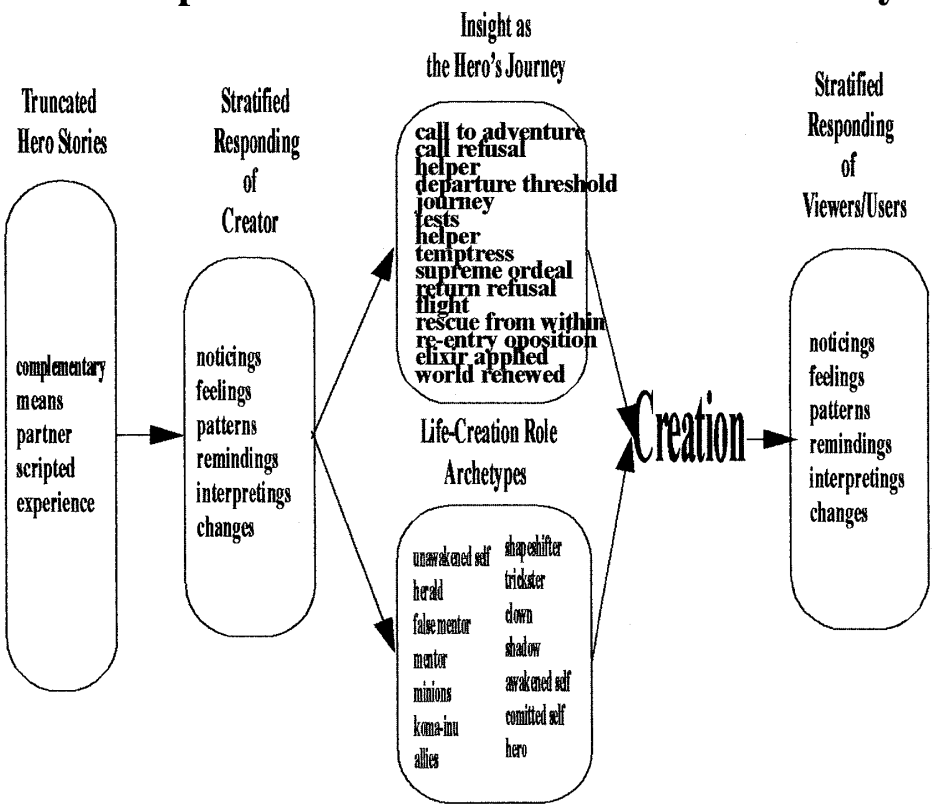
APPENDIX: 10th Six Models: Mind Models of Creativity

The Experience Realizaion Model of Creativity



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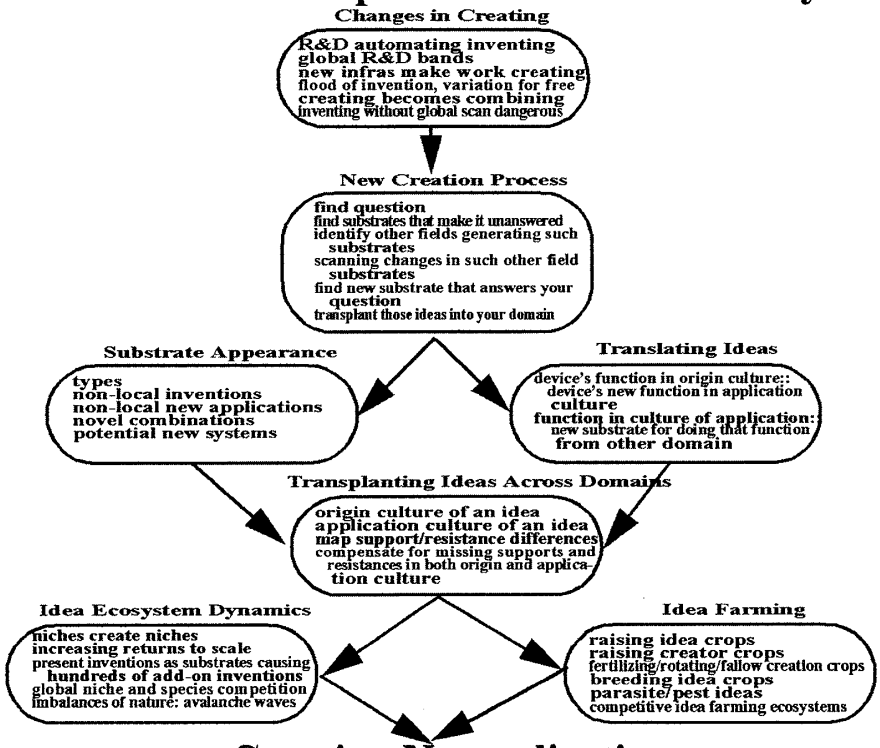
The Substrate Update Model of Creativity



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